

RAMP METER

DEVELOPMENT PLAN

District 7
Los Angeles and Ventura Counties



STATE OF CALIFORNIA
Governor Arnold Schwarzenegger

BUSINESS, TRANSPORTATION AND HOUSING AGENCY
Secretary Sunne Wright McPeak

DEPARTMENT OF TRANSPORTATION
Director Will Kempton



DIVISION OF OPERATIONS
OFFICE OF FREEWAYS OPERATIONS
Ramp Metering Branch

July 2005



RAMP METER

DEVELOPMENT PLAN

DEPARTMENT OF TRANSPORTATION

DISTRICT 7

Los Angeles and Ventura Counties

DOUG FAILING
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RAMP METERING BRANCH

July 2005

RAMP METER DEVELOPMENT PLAN

DISTRICT 7

This RAMP METER DEVELOPMENT PLAN, for District 7, has been prepared under the direction of the following registered engineers. The registered Civil Engineers attest to the technical information contained therein and has judged the qualifications of any technical specialists, providing engineering data upon which recommendations, conclusions and decisions are based.

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The Office of Freeway Operations, Ramp Metering Branch, prepares the RAMP METER DEVELOPMENT PLAN, in District 7. The information in this report encompasses all metered and non-metered on-ramps in addition to metered connectors in Los Angeles and Ventura Counties.

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INTRODUCTION

This Ramp Meter Development Plan (RMDP) has been prepared to identify existing metered on-ramps, non-metered on-ramps, and metered freeway connectors in accordance with Deputy Directive (DD-35) and Metering Policy Procedures (See Attachments 3 and 4). This plan includes on-ramps, which are expected to be metered within the next 10 years. In addition, it defines the District's policy regarding the planning and implementation of ramp meters, connector meters and HOV bypass lanes.

The primary objective of ramp metering is to reduce congestion and the overall travel time to motorists on the freeway. Other benefits include enhancing safety by reducing congestion-related accidents and air pollution caused by vehicle emissions.

Since 1969, Caltrans has been implementing ramp and freeway connector metering as an effective traffic management strategy. Metering operates most effectively when traffic is controlled on all inputs leading to a freeway corridor. This control has been accomplished in District 7 by metering freeway on-ramps and freeway-to-freeway connectors.

POLICIES

As stated in Deputy Directive (DD-35), District 7 is committed to using ramp metering as an effective traffic management strategy to maintain an efficient freeway system and protect the investment made in constructing freeways, by keeping them operating under or near capacity flow rates. According to Headquarters' Memorandum dated July 31, 2000, an HOV preferential bypass lane shall be considered at all ramp-metering locations (See Attachment 5). In Addition, a Ramp Meter Design Manual was issued by Headquarters in January 2000, as a uniform guideline for ramp meter design throughout the State.

BACKGROUND

Ramp metering has been operating in the Los Angeles area since 1969. It is a strategy used primarily to reduce recurrent freeway congestion that occurs when demand exceeds capacity. This strategy can also be effective in addressing non-recurrent congestion, which occurs as a result of incidents, accidents and non-planned events.

In District 7, Ramp metering is introduced when segments of freeway mainline start to experience increase in traffic volumes, which may lead to congestion and commute delays. To improve this condition, meters are installed at the on-ramps to control the number of vehicles entering the freeway. The metering rate (cycle length) is usually determined based on the on-

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ramp traffic volume, mainline vehicle capacity and ramp vehicular storage. It is initially determined by the traffic engineer, but could increase up to rest in green, if real-time occupancy and volume adjacent to the ramp fall respectively below critical occupancy and volume threshold values set by the engineer. This mode of operation is known as local mainline traffic responsive metering.

Most meters allow one vehicle per cycle per lane; however, it could be programmed to allow 2 or a maximum of 3 vehicles per cycle per lane. This condition is referred to as platoon metering. Platoon meters are generally used for freeway connectors and some on-ramps, where traffic volumes are considerably high. The metering cycle for platoon operation is distinguished by adding a yellow phase to extend the cycle length, when more than one vehicle is entering the freeway.

During congestion peak periods, traffic at the on-ramp might back up to City streets or freeway mainline in case of connectors. To mitigate this condition, the engineer has the option of activating a queue loop, located near the entrance of most on-ramps and all metered connectors. When the queue loop is triggered, the metering rate will gradually increase relieving back up into adjacent City streets or connecting freeway mainline.

In District 7, close to half of the metered on-ramps include a non-metered HOV bypass lane. In some cases, the HOV bypass lane might have to be converted to a metered mix flow lane due to high on-ramp traffic volume. Thus, metering of both ramp lanes provides additional storage capacity. The HOV bypass lane will also be eliminated when it creates a trap lane for single occupant vehicles. The contents of Exceptions to the Ramp Meter Policy fact sheet, including converting or eliminating HOV lanes, are listed in the January 2000 edition, of the Ramp Meter Design Manual (See Attachment 5).

EXISTING RAMP METERING SYSTEM

District 7 serving Los Angeles and Ventura counties, consists of 870 metered on-ramps (See Attachment 1A) and 19 metered connectors (See Attachment 1B), making it the largest ramp metering District in California. The Districts' additional 372 on-ramps (See Attachments 1C and 1D) and multiple freeway-to-freeway connectors are not metered due to lack of funding, geometric constraints, heavy traffic demand or light traffic conditions.

District 7 freeway system is divided into various sections. A lead engineer is in charge of ramp and connector meters in each section. These sections are further subdivided in order to be effectively monitored by different members of the Ramp Metering Branch (See Attachments 2A and 2B).

FUTURE RAMP METERING SYSTEM

District 7 plans to install ramp metering systems (RMS) and deploy System Wide Adaptive Ramp Metering (SWARM) on various sections of mainline freeways. These sections are starting to experience gradual increase in traffic volumes. Some of the proposed RMS locations are programmed to be funded in the 10 year Shopp Plan. Others might be incorporated in upcoming freeway widening or mainline HOV projects. For more details, refer to Future On-Ramp Meters (Attachment 1C) and SWARM (Attachment 6).

EXISTING FREEWAY TO FREEWAY CONNECTOR METERING SYSTEM

The freeway to freeway connector metering system in District 7 has proved to be a successful strategy in reducing traffic congestion. It saves a great deal of traffic delay and reduces traffic collisions by breaking up vehicle platoons entering the freeway. The concept of freeway to freeway connector metering was developed as a tool to regulate extremely high traffic volume connecting from one freeway to another. The strategy for a connector metering system is similar to that of the ramp metering system. However, due to higher speeds and heavy traffic volumes on the connectors, longer storage and advance warning devices are required in order to safely operate the connector meters. By regulating freeway to freeway access, the receiving freeway benefits from an increase in mainline speed contributing to a decrease in the overall travel time.

Connector metering consists of installing signal meter heads and electronic warning devices on the connectors to control the number of vehicles merging onto the freeway. The safety features include a "Meter On" sign, a "Prepare to Stop" sign, a signal ahead warning (W-41) sign with flashing beacons, in addition to overhead and ground mounted traffic signals. There is also a queue override system to reduce excessive queue build up on the connector. Due to longer storage length and specific geometric requirements, the existing connector meters are confined mainly to newer freeways like Route 105 (See Attachment 1B). Thus, on most existing connectors, due to their original design accompanied with inadequate storage capacity and insufficient sight distances, connector metering can not be implemented.

FUTURE CONNECTOR METERING SYSTEM

Currently, with the exception of Route 10 / 605 Interchange, no existing freeway connector locations are proposed for reconstruction. There are several other locations where connector metering would benefit the operation of the interchange. To implement connector metering, however, would require overcoming several issues such as, inadequate storage capacity and

geometric features impacting sight distance. To correct these deficiencies would require partial or full reconstruction of the interchanges. This would make metering implementation cost prohibitive. Any future design involving freeway interchange, however, should include a traffic study to implement connector metering.

STRATEGIC PLAN

Over the past 30 years, multiple traffic control strategies have been used, in conjunction with ramp metering, to maximize freeway efficiency. One of the major achievements in this field was the establishment of a regional Transportation Management Center (TMC), to monitor traffic and respond to major incidents, thereby minimizing non-recurrent congestion delays. In addition, the use of advanced technologies is being developed to control ramp meters in real time and on corridor basis. One of these technologies, currently being deployed in District 7, is System Wide Adaptive Ramp Metering (SWARM) (See Attachment 6). The District shall continue to explore these strategies among others, such as metering HOV bypass lanes on freeway on-ramps in order to more effectively control traffic flow onto the freeway mainline.

In the past, there have been opportunities to include ramp meter systems in major and minor roadway construction projects, during the initial project development phases. Currently, new Ramp Metering Systems (RMS) installation, aside from having their own contracts, are included in freeway mainline widening projects, High Occupancy Vehicle (HOV) projects, in addition to closed circuit television (CCTV) and various communication system contracts.

ATTACHMENTS

METERED ON-RAMP OPERATIONAL INVENTORY

Co.	Rte	Dir	Location	E No.	PM	KP	Ramp Type	Ramp Storage	Platoon Metering	Total Lanes	HOV Location		"Meter on" Sign (Loc.)	
											Left	Right	Left	Right
LA	2	W	Verdugo Bl	4472	22.62	36.42	Diamond	12	No	2	X			X
LA	2	W	Mountain	4741	19.83	31.93	Diamond	12	No	2	X			X
LA	2	W	Holly	4470	18.91	30.45	Diamond	10	No	2	X			X
LA	2	W	Colorado	4467	18.23	29.35	Diamond	20	No	2	X		X	X
LA	2	W	Verdugo Rd	4466	17.04	27.43	Hook	18	Yes	1			X	X
LA	2	W	San Fernando	4465	15.92	25.63	Diamond	6	No	2	X		X	X
LA	2	W	Riverside	4815	14.95	24.07	Hook	12	No	2	X		X	X
LA	5	S	Valencia Bl. WB	-	52.46	84.46	Loop	60	No	2			X	X
LA	5	S	Valencia Bl. EB	-	52.30	84.20	Diamond	60	No	2				X
LA	5	S	Lyons/Piro Cyn.	4623	50.14	80.73	Loop	50	No	2				X
LA	5	S	Van Nuys WB	3641	38.55	61.68	Loop	9	No	2	X			X
LA	5	S	Van Nuys EB	3642	38.34	61.34	Diamond	14	No	2	X		X	
LA	5	S	Terra Bella	3488	37.84	60.54	Diamond	20	No	1			X	
LA	5	S	Osborne WB	3487	37.47	59.95	Loop	14	No	1				X
LA	5	S	Osborne EB	3486	37.30	59.68	Diamond	18	No	2	X		X	
LA	5	S	Brandford	3232	36.75	58.80	Diamond	27	No	2	X			
LA	5	S	Sheldon	3233	35.84	57.34	Hook	17	No	1				
LA	5	S	Lankershim	3234	35.07	56.11	Loop	14	No	1				
LA	5	S	Tuxford	3285	34.88	55.81	Slip	7	No	2	X			
LA	5	S	Penrose	3236	34.24	54.78	Hook	18	No	1				
LA	5	S	Sunland	3237	33.58	53.73	Diamond	18	No	1				
LA	5	S	Roscoe	3238	33.23	53.17	Diamond	11	No	2		X		
LA	5	S	Hollywood way	3239	32.28	51.65	Diamond	9	No	1				
LA	5	S	Buena Vista	3226	31.41	50.26	Hook	11	No	2				
LA	5	S	Lincoln	3241	30.69	49.10	Slip	9	No	1				
LA	5	S	Burbank WB	3242	29.89	47.82	Loop	14	No	1			X	
LA	5	S	Burbank EB	3243	29.68	47.49	Diamond	9	No	2	X		X	
LA	5	S	Verdugo	3105	28.90	46.24	Hook	10	No	1			X	
LA	5	S	Alameda WB	3104	28.30	45.28	Loop	11	No	1			X	
LA	5	S	Alameda EB	3103	28.20	45.12	Diamond	16	No	1			X	
LA	5	S	Western WB	3102	27.70	44.32	Loop	11	No	2	X		X	
LA	5	S	Western EB	3101	27.66	44.26	Diamond	16	No	2	X		X	
LA	5	S	Zoo Dr.	3100	26.35	42.16	Diamond	16	No	1			X	X
LA	5	S	Colorado	3099	25.85	41.36	Loop	27	No	1			X	
LA	5	S	Griffith Pk	3098	24.50	39.20	Hook	26	No	1				X
LA	5	S	Los Feliz	3097	24.17	38.67	Loop	19	No	2	X		X	
LA	5	S	Glendale	3096	23.58	37.73	Hook	36	No	1			X	X
LA	5	S	Stadium Way	3095	21.71	34.74	Hook	27	No	1			X	X
LA	5	S	Duvall	3094	20.70	33.12	Hook	19	No	1			X	X
LA	5	S	Ave. 26	3146	20.33	32.53	Hook	11	No	2	X		X	X
LA	5	S	Broadway	3624	19.45	31.12	Hook	24	No	2	X		X	
LA	5	S	Mission	3625	18.59	29.74	Hook	24	No	2				X
LA	5	S	Cesar Chavez	-	17.93	28.69	Hook	27	No	2				
LA	5	S	Fourth	3629	17.44	27.90	Hook	23	No	2			X	X
LA	5	S	Seven	3147	16.60	26.56	Diamond	12	No	1				X
LA	5	S	Eight	3148	16.49	26.38	Hook	30	No	1			X	
LA	5	S	Concord	3149	15.77	25.23	Hook	3	No	1			X	
LA	5	S	Eastern & Atlantic	3151	14.76	23.62	Hook	28	No	2	X			X
LA	5	S	Ditman	3151	14.76	23.62	Hook	3	No	1				
LA	5	S	Washington	3330	11.54	18.46	Diamond	52	No	2				
LA	5	S	Slauson	3332	9.87	15.79	Hook	41	No	2			X	X
LA	5	S	Paramount	3043	8.93	14.29	Hook	17	No	2	X		X	
LA	5	S	Lakewood SB	3044	8.35	13.36	Loop	25	No	1				X
LA	5	S	Lakewood NB	3045	8.21	13.14	Hook	17	No	1				X
LA	5	S	Florence	3093	6.50	10.40	Hook	16	No	1				
LA	5	S	Orrday	3092	6.04	9.66	Hook	7	No	1				
LA	5	S	Imperial	3091	4.89	7.82	Hook	18	No	1				
LA	5	S	Norwalk	3090	4.28	6.85	Diamond	9	No	1			X	
LA	5	S	Rosecrans	3252	3.28	5.25	Hook	44	No	1				X
LA	5	S	Carmenita	3253	2.27	3.63	Hook	10	No	1				
LA	5	S	Alondra & Marquart	3254	1.67	2.67	Hook	14	No	1				
LA	5	S	Valley View	3255	1.06	1.70	Hook	14	No	1				
LA	5	N	Valley View	3268	1.11	1.78	Hook	10	No	1				X
LA	5	N	Alondra	3629	1.56	2.50	Loop	27	No	2				

METERED ON-RAMP OPERATIONAL INVENTORY

Co.	Rte	Dir	Location	E No.	PM	KP	Ramp Type	Ramp Storage	Platoon Metering	Total Lanes	HOV Location		"Meter on" Sign (Loc.)	
											Left	Right	Left	Right
LA	5	N	Carmenita	3270	2.51	4.02	Hook	9	No	1			X	
LA	5	N	Norwalk NB	3272	4.36	6.98	Loop	16	No	1			X	
LA	5	N	Norwalk SB	3273	4.58	7.33	Hook	14	No	1			X	
LA	5	N	Imperial	3274	4.96	7.94	Diamond	18	No	1		X		
LA	5	N	Pioneer	3275	5.25	8.40	Diamond	9	No	1		X		
LA	5	N	Florence & Orr-day	3276	6.20	9.92	Hook	40	No	2		X		X
LA	5	N	Lakewood NB	3586	8.27	13.23	Loop	19	No	2			X	
LA	5	N	Lakewood SB	3587	8.42	13.47	Hook	11	No	2				
LA	5	N	Paramount	3588	8.92	14.27	Loop	34	No	2				
LA	5	N	Marengo	3034	18.77	30.03	Hook	36	No	2		X	X	
LA	5	N	Pasadena	3035	20.00	32.00	Hook	19	No	2	X		X	
LA	5	N	Riverside	3037	21.10	33.76	Hook	23	No	2		X		
LA	5	N	Stadium Way	3037	21.80	34.88	Hook	22	No	2	X			
LA	5	N	Fletcher	3038	23.20	37.12	Diamond	59	No	2		X	X	
LA	5	N	Glendale	3039	23.86	38.18	Diamond	23	No	1			X	
LA	5	N	Los Feliz EB	3040	24.36	38.98	Loop	105	No	2	X	X	X	
LA	5	N	Los Feliz WB	3041	24.54	39.26	Diamond	32	No	1			X	
LA	5	N	Colorado	3042	25.90	41.44	Diamond	18	Yes	2	X		X	
LA	5	N	Western EB	3220	27.77	44.43	Loop	11	No	1			X	
LA	5	N	Western WB	3219	27.92	44.67	Diamond	16	No	2	X		X	
LA	5	N	Alameda EB	3222	28.40	45.44	Loop	11	No	1			X	
LA	5	N	Alameda WB	3221	28.45	45.52	Diamond	20	No	1			X	
LA	5	N	Olive	3223	29.27	46.83	Hook	9	No	1		X		
LA	5	N	Burbank Bl	3224	29.97	47.95	Hook	11	No	1			-	X
LA	5	N	Lincoln	3225	30.69	49.10	Slip	19	No	1				
LA	5	N	Buena Vista	3226	31.41	50.26	Hook	11	No	1				
LA	5	N	Hollywood Way	3227	32.41	51.86	Diamond	23	No	3		X		
LA	5	N	Sunland	3228	33.72	53.95	Diamond	11	No	1				
LA	5	N	Tuxford	3229	34.78	55.65	Diamond	34	No	1				
LA	5	N	Lankershim	3230	35.07	56.11	Diamond	13	No	1				
LA	5	N	Sheldon	3231	35.84	57.34	Loop	31	No	1				
LA	5	N	Osborne EB	3484	37.37	59.79	Loop	20	No	1				
LA	5	N	Osborne WB	3485	37.55	60.08	Diamond	22	No	1				
LA	5	N	Valencia Bl.	N/A	52.46	83.94	Loop	14	No	2			X	
LA	10	E	4 th Street	4823	1.80	2.88	Diamond	63	No	2		X		
LA	10	E	Lincoln	3155	2.10	3.36	Diamond	36	No	2			X	
LA	10	E	Cloverfield	3156	3.49	5.58	Diamond	54	No	2		X		
LA	10	E	Centinela	3157	4.50	7.20	Diamond	60	No	2		X	X	
LA	10	E	Bundy Dr.	3158	4.68	7.49	Diamond	64	No	2	X			
LA	10	E	Overland	3132	6.50	10.40	Diamond	46	No	2				
LA	10	E	Manning	3133	7.20	11.52	Hook	41	No	2		X		
LA	10	E	Robertson/National	3134	7.90	12.64	Loop	20	No	2	X	X	X	
LA	10	E	La Cienega	3135	8.70	13.92	Hook	34	No	2				
LA	10	E	Venice	3136	9.01	14.42	Diamond	14	No	2	X			
LA	10	E	Washington	3137	9.50	15.20	Diamond	25	No	2	X			
LA	10	E	La Brea SB	3138	10.30	16.48	Loop	16	No	1				
LA	10	E	La Brea NB	3139	10.50	16.80	mpound Cu	50	No	2				
LA	10	E	Crenshaw	3140	11.53	18.45	Diamond	54	No	2				
LA	10	E	Arlington	3141	12.45	19.92	Diamond	40	No	2				
LA	10	E	Western	3142	12.95	20.72	Diamond	28	No	2	X			
LA	10	E	Normandie	3143	13.44	21.50	Diamond	38	No	2				
LA	10	E	Vermont	3144	13.95	22.32	Diamond	19	No	2		X		
LA	10	E	Hoover	3125	14.30	22.88	Hook	36	No	2				
LA	10	E	Flower	3214	15.33	24.53	Hook	36	No	2		X	X	
LA	10	E	Los Angeles	3215	15.78	25.25	Diamond	58	No	2		X	X	
LA	10	E	San Pedro	3216	16.22	25.95	mpound Cu	68	No	2		X	X	
LA	10	E	Central	3217	16.84	26.94	Diamond	64	No	2				
LA	10	E	Alameda	3218	17.10	27.36	Loop	64	No	2		X	X	
LA	10	E	Olympic	5469	17.43	27.89	Loop	25	No	1				
LA	10	E	Santa Fe	3718	17.60	28.16	Hook	32	No	1		X	X	
LA	10	E	Atlantic SB	3726	23.28	37.25	Loop	13	No	1			X	
LA	10	E	Atlantic NB	3727	23.38	37.41	Direct	15	No	1			X	
LA	10	E	Garfield SB	3728	23.93	38.29	Loop	13	No	1				
LA	10	E	Garfield NB	3729	24.03	38.45	Direct	15	No	1		X		

METERED ON-RAMP OPERATIONAL INVENTORY

Co.	Rte	Dir	Location	E No.	PM	KP	Ramp Type	Ramp Storage	Platoon Metering	Total Lanes	HOV Location		"Meter on" Sign (Loc.)	
											Left	Right	Left	Right
LA	10	E	New SB	3730	24.77	39.63	Loop	14	No	1				X
LA	10	E	New NB	3731	24.87	39.79	Direct	19	No	1				X
LA	10	E	Del Mar SB	3732	25.26	40.42	Loop	13	No	1				X
LA	10	E	Del Mar NB	3733	25.38	40.61	Direct	21	No	1				X
LA	10	E	San Gabriel SB	3734	25.77	41.23	Loop	14	No	1				X
LA	10	E	San Gabriel NB	3735	25.89	41.42	Direct	16	No	1				X
LA	10	E	Walnut Grove	3736	26.32	42.11	Direct	16	No	1				X(2)
LA	10	E	Rosemead SB	3738	26.79	42.86	Loop	16	No	1				X
LA	10	E	Rosemead NB	3739	26.94	43.10	Direct	25	No	1				X
LA	10	E	Flair	3740	27.10	43.36	Button Hook	6	No	2			X	X
LA	10	E	Baldwin	3741	28.09	44.94	Direct	19	No	2	X			X(2)
LA	10	E	Santa Anita	3430	28.78	46.05	Slip	14	No	2	X	X		
LA	10	E	Valley Blvd	3431	29.51	47.22	Loop	7	No	2				X
LA	10	E	Stewart	3432	29.98	47.97	Diamond	54	No	1				X
LA	10	E	Durfee/Garvey	3433	30.70	49.12	Diamond	32	No	2			X	X
LA	10	E	Baldwin Park	3747	32.31	51.70	Direct	14	No	1				X
LA	10	E	Puente	3748	33.46	53.54	Button Hook	10	No	2				X(2)
LA	10	E	West Covina Pkwy	3749	34.44	55.10	Loop	16	No	2	X			X
LA	10	E	Vincent SB	3750	35.36	56.58	Loop	13	No	2	X			X
LA	10	E	Vincent NB	3751	35.50	56.80	Direct	25	No	2				X
LA	10	E	Azusa SB	3752	36.46	58.34	Loop	13	No	1				X
LA	10	E	Azusa NB	3753	36.60	58.56	Direct	19	No	1				X
LA	10	E	Citrus	3754	37.59	60.14	Button Hook	8	No	1				X(2)
LA	10	E	Barranca	3755	38.09	60.94	Button Hook	9	No	2				X(2)
LA	10	E	Grand	3756	38.48	61.57	Loop	14	No	1				X(2)
LA	10	E	Holt SB	3757	38.95	62.32	Loop	13	No	1			X	
LA	10	E	Holt NB	3758	39.14	62.62	Diamond	29	No	1			X	
LA	10	E	Via Verde	3759	40.58	64.93	Diamond	14	No	2	X		X(2)	
LA	10	E	Fairplex	3762	43.76	70.02	Diamond	36	No	2			X	X
LA	10	E	Dudley	3763	44.13	70.61	Loop	15	No	1			X	X
LA	10	E	Orange Grove	3764	46.01	73.62	Diamond	50	No	2			X	X
LA	10	E	Towne	3765	46.58	74.53	Diamond	22	No	2	X	X		X
LA	10	E	Indian Hill	3766	47.87	76.59	Diamond	14	No	2	X		X	X
LA	10	W	Indian Hill	3767	47.61	76.18	Diamond	16	No	2	X		X	X
LA	10	W	Towne	3768	46.23	73.97	Diamond	18	No	2			X	X
LA	10	W	Garey	3769	45.62	72.99	Diamond	13	No	2			X	X
LA	10	W	White	3770	45.17	72.27	Diamond	13	No	2	X	X		X
LA	10	W	Dudley	3771	43.85	70.16	Button Hook	11	No	1				X
LA	10	W	Fairplex	3772	43.53	69.65	Diamond	64	No	2			X	X
LA	10	W	Kellogg	3773	41.99	67.18	Diamond	26	No	2				X
LA	10	W	Via Verde	3774	40.35	64.56	Diamond	13	No	2	X		X	X
LA	10	W	Holt NB	3775	39.05	62.48	Loop	14	No	1				X
LA	10	W	Holt SB	3776	38.89	62.22	Diamond	18	No	2	X		X	
LA	10	W	Grand	3777	38.40	61.44	Diamond	39	No	2				X(2)
LA	10	W	Barranca NB	3778	38.07	60.91	Button Hook	11	No	2				X(2)
LA	10	W	Barranca SB	3779	37.92	60.67	Diamond	9	No	2	X			X
LA	10	W	Citrus NB	3780	37.53	60.05	Loop	11	No	2	X			X
LA	10	W	Citrus SB	3781	37.43	59.89	Diamond	11	No	2	X			X
LA	10	W	Azusa NB	3782	36.52	58.43	Loop	13	No	1	X			X
LA	10	W	Azusa SB	3783	36.41	58.26	Diamond	11	No	2	X			X
LA	10	W	Vincent NB	3784	35.45	56.72	Loop	14	No	2	X			X
LA	10	W	Vincent SB	3785	35.36	56.58	Diamond	18	No	2	X			X
LA	10	W	Pacific	3786	34.36	54.98	Button Hook	7	No	2	X			X(2)
LA	10	W	Puente	3787	33.48	53.57	Button Hook	8	No	2				X(2)
LA	10	W	Francisquito	3788	32.78	52.45	Button Hook	15	No	2				X
LA	10	W	Baldwin Park NB	3789	32.33	51.73	Loop	14	No	1				X
LA	10	W	Baldwin Park SB	3790	32.16	51.46	Diamond	20	No	2	X			X
LA	10	W	Frazier	3791	31.72	50.75	Button Hook	7	No	2	X		X	X(2)
LA	10	W	Valley	3744	29.60	47.36	Loop	25	No	1				X
LA	10	W	Peck	3795	29.35	46.96	Direct	23	No	1				X
LA	10	W	Santa Anita	3796	28.56	45.70	Diamond	21	No	2	X			X
LA	10	W	Temple City	3797	27.67	44.27	Button Hook	5	No	1		X		
LA	10	W	Rosemead NB	3798	26.92	43.07	Loop	16	No	1				X
LA	10	W	Rosemead SB	3799	26.79	42.86	Direct	14	No	1				X

METERED ON-RAMP OPERATIONAL INVENTORY

Co.	Rte	Dir	Location	E No.	PM	KP	Ramp Type	Ramp Storage	Platoon Metering	Total Lanes	HOV Location		"Meter on" Sign (Loc.)	
											Left	Right	Left	Right
LA	10	W	Walnut Grove	3800	26.29	42.06	Diamond	21	No	1			X	
LA	10	W	San Gabriel NB	3801	25.90	41.44	Loop	21	No	1				X
LA	10	W	San Gabriel SB	3802	25.80	41.28	Direct	20	No	1			X	
LA	10	W	Del Mar NB	3803	25.39	40.62	Loop	20	No	1			X	
LA	10	W	Del Mar SB	3804	25.22	40.35	Direct	25	No	1				X
LA	10	W	New NB	3805	24.89	39.82	Loop	14	No	1				X
LA	10	W	New SB	3806	24.82	39.71	Direct	16	No	1			X	
LA	10	W	Garfield NB	3807	24.04	38.46	Loop	18	No	1				X
LA	10	W	Garfield SB	3808	23.96	38.34	Direct	21	No	1			X	
LA	10	W	Atlantic NB	3809	23.38	37.41	Loop	20	No	1				X
LA	10	W	Atlantic SB	3810	23.29	37.26	Direct	21	No	1			X	
LA	10	W	Fremont	3811	22.30	35.68	Button Hook	8	No	2			X	X
LA	10	W	Winthrop	3812	21.50	34.40	Slip	18	No	1				X
LA	10	W	Santa Fe	3819	17.57	28.11	Hook	30	No	1			X	X
LA	10	W	Alameda	3820	17.09	27.34	Hook	18	No	2			X	X
LA	10	W	Central	3821	16.21	25.94	Diamond	36	No	1			X	X
LA	10	W	Maple	3822	15.64	25.02	Diamond	22	No	2			X	X
LA	10	W	Grand Ave (To Rte 110)	3824	15.19	24.30	Diamond	30	No	1				X
LA	10	W	Grand Ave (To WB 10)	3823	15.16	24.26	Diamond	30	No	1			X	
LA	10	W	Hoover/20th St.	3125	14.10	22.56	Hook	40	No	2				X
LA	10	W	Vermont	3142	13.66	21.86	Diamond	46	No	2				
LA	10	W	Normandie	3123	13.21	21.14	Diamond	40	No	2				
LA	10	W	Western	3122	12.60	20.16	Diamond	33	No	2	X			
LA	10	W	Arlington	3121	12.23	19.57	Diamond	44	No	2				
LA	10	W	Crenshaw	3120	11.20	17.92	Diamond	30	No	2	X			
LA	10	W	La Brea NB	3119	10.50	16.80	Loop	16	No	1			X	
LA	10	W	La Brea SB	3118	10.40	16.64	Mpound Cu	48	No	2				X
LA	10	W	Fairfax	3117	9.21	14.74	Diamond	36	No	2	X			
LA	10	W	La Cienega	3116	8.70	13.92	Diamond	54	No	2			X	X
LA	10	W	Robertson	3115	7.80	12.48	Hook	60	No	2				X
LA	10	W	Overland	3114	6.46	10.34	Hook	60	No	2				
LA	10	W	Centinela	3826	4.12	6.59	Hook	36	No	2				
LA	10	W	20 th Street	4842	2.93	4.69	Diamond	14	No	2			X	X
VEN	23	N	New Los Angeles	4572	11.43	18.29	Loop	60	No	2				X
LA	57	S	Auto Center Drive	4273	11.41	18.25	Diamond	26	No	2	X		X	X
LA	57	S	Arrow Hwy WB	4274	10.90	17.44	Loop	18	No	2	X		X	
LA	57	S	Arrow Hwy EB	4275	10.70	17.12	Diamond	14	No	2	X		X	
LA	57	S	Covina	4276	10.08	16.12	Diamond	33	No	2	X		X	X
LA	57	S	Via Verde	4277	8.78	14.04	Hook	20	No	1				X
LA	57	S	Temple Ave WB	3981	6.28	10.05	Loop	18	No	2	X		X	
LA	57	S	Temple Ave EB	3982	5.97	9.55	Diamond	32	No	1			X	
LA	57	S	Sunset Crossing	3983	5.04	8.06	Loop	14	No	2	X			X(2)
LA	57	S	Pathfinder Rd.	3985	3.05	4.88	Diamond	21	No	2	X			
LA	57	S	Diamond Bar Bl.	3986	1.82	2.91	Diamond	36	No	2				
LA	57	N	Brea Canyon Rd.	3974	1.26	2.02	Diamond	25	No	2			X	
LA	57	N	Diamond Bar Bl.	3975	2.20	3.52	Diamond	29	No	2	X			
LA	57	N	Pathfinder Rd.	3976	3.45	5.52	Diamond	25	No	2	X			
LA	57	N	Sunset Crossing	3977	5.27	8.43	Slip	20	No	1			X(2)	
LA	57	N	Temple Ave EB	3978	6.16	9.86	Loop	21	No	2	X		X	
LA	57	N	Temple Ave WB	3979	6.35	10.16	Diamond	30	No	2	X		X	
LA	57	N	Campus Dr.	4558	7.30	11.68	Split	21	No	2	X		X	X
LA	57	N	Via Verde	4280	8.83	14.12	Diamond	34	No	2	X		X	
LA	57	N	Covina	4281	10.26	16.41	Hook	34	No	1			X	X
LA	57	N	Arrow Hwy	4282	10.74	17.18	Hook	18	No	2	X		X	X
LA	60	E	Soto	3131	0.64	1.02	Button Hook	21	No	1				
LA	60	E	Lorena	3127	1.60	2.56	Diamond	40	No	2				
LA	60	E	Indiana	3128	2.05	3.28	Diamond	20	No	1				
LA	60	E	Third St.	3129	2.50	4.00	Button Hook	64	No	2				
LA	60	E	Atlantic SB	4007	4.35	6.96	Loop	18	No	1				
LA	60	E	Atlantic NB	4008	4.56	7.30	Diamond	16	No	2	X			
LA	60	E	Paramount SB	4010	7.74	12.38	Loop	21	No	2	X		X	
LA	60	E	Paramount NB	4011	7.94	12.70	Diamond	18	No	2	X			
LA	60	E	San Gabriel	4012	8.52	13.63	Loop	23	No	2				
LA	60	E	Rosemead SB	4013	9.47	15.15	Loop	38	No	2				X

METERED ON-RAMP OPERATIONAL INVENTORY

Co.	Rte	Dir	Location	E No.	PM	KP	Ramp Type	Ramp Storage	Platoon Metering	Total Lanes	HOV Location		"Meter on" Sign (Loc.)	
											Left	Right	Left	Right
LA	60	E	Rosemead NB	4014	9.63	15.41	Diamond	24	No	2			X	
LA	60	E	Santa Anita SB	4015	10.13	16.21	Loop	13	No	2	X		X	
LA	60	E	Santa Anita NB	4016	10.28	16.45	Diamond	14	No	1				
LA	60	E	Peck/Durfee	4017	11.00	17.60	Button Hook	13	No	2		X	X	X
LA	60	E	Crossroads Pkwy	4508	12.71	20.34	Diamond	30	No	2				
LA	60	E	Seventh Ave	4020	14.50	23.20	Diamond	14	No	2	X			
LA	60	E	Hacienda SB	4021	15.91	25.46	Loop	18	No	2	X		X	
LA	60	E	Hacienda NB	4022	16.13	25.81	Diamond	24	No	2	X		X	
LA	60	E	Azusa SB	4024	17.94	28.70	Loop	16	No	2	X		X	
LA	60	E	Azusa NB	4023	18.15	29.04	Diamond	23	No	2	X		X	
LA	60	E	Fullerton SB	4025	19.44	31.10	Loop	17	No	1				
LA	60	E	Fullerton NB	4026	19.63	31.41	Diamond	20	No	2	X		X	
LA	60	E	Nogales SB	4027	20.39	32.62	Loop	11	No	2	X			X
LA	60	E	Nogales NB	4028	20.53	32.85	Diamond	17	No	2	X			X
LA	60	E	Fairway SB	4029	21.46	34.34	Loop	17	No	1				
LA	60	E	Fairway NB	4030	21.69	34.70	Diamond	26	No	2	X		X	
LA	60	E	Brea Canyon	4031	22.95	36.72	Button Hook	10	No	2				X(2)
LA	60	E	Grand	4033	24.45	39.12	Diamond	15	No	2		X	X	
LA	60	E	Diamond Bar	4034	25.60	40.96	Diamond	14	No	2	X		X	X
LA	60	E	Phillips Ranch NB	4036	28.97	46.35	Diamond	36	No	2		X	X	
LA	60	E	Garey	4037	29.51	47.22	Diamond	16	No	2		X	X	
LA	60	E	Reservoir	4814	30.59	48.94	Diamond	44	No	2				
LA	60	W	Reservoir	4038	30.19	48.30	Diamond	19	No	2		X		
LA	60	W	Garey	4039	29.15	46.64	Diamond	24	No	2		X	X	
LA	60	W	Phillips Ranch NB	4040	28.00	44.80	Loop	46	No	2				X
LA	60	W	Phillips Ranch SB	4041	27.87	44.59	Diamond	36	No	2				
LA	60	W	Diamond Bar	4042	25.87	41.39	Loop	16	No	2	X		X	X
LA	60	W	Grand	4044	24.44	39.10	Loop	32	No	2		X	X	
LA	60	W	Brea Canyon	4046	22.80	36.48	Diamond	44	No	2		X		X(2)
LA	60	W	Fairway	4047	21.31	34.10	Diamond	25	No	2	X			X
LA	60	W	Nogales NB	4048	20.47	32.75	Loop	12	No	2	X			X
LA	60	W	Nogales SB	4049	20.34	32.54	Diamond	14	No	2	X			X
LA	60	W	Fullerton NB	4050	19.46	31.14	Loop	33	No	2				X
LA	60	W	Fullerton SB	4051	19.32	30.91	Diamond	16	No	1				X
LA	60	W	Azusa NB	4052	18.00	28.80	Loop	14	No	2	X		X	
LA	60	W	Azusa SB	4053	17.77	28.43	Diamond	50	No	2				X
LA	60	W	Hacienda NB	4054	15.99	25.58	Loop	32	No	2				X
LA	60	W	Hacienda SB	4055	15.79	25.26	Diamond	21	No	2	X		X	
LA	60	W	Crossroads Pkwy	4509	12.86	20.58	Button Hook	14	No	1				
LA	60	W	Peck NB	4059	11.06	17.70	Loop	15	No	1				X
LA	60	W	Peck SB	4060	10.91	17.46	Diamond	13	No	2	X		X	
LA	60	W	Santa Anita NB	4061	10.35	16.56	Button Hook	5	No	1				X
LA	60	W	Santa Anita SB	4062	10.14	16.22	Diamond	42	No	2	X		X	
LA	60	W	Rosemead NB	4064	9.54	15.26	Loop	13	No	1				X
LA	60	W	Rosemead SB	4063	9.39	15.02	Diamond	19	No	2	X			X
LA	60	W	San Gabriel	4065	8.59	13.74	Loop	18	No	1				X
LA	60	W	Paramount NB	4066	7.82	12.51	Loop	14	No	2	X			X
LA	60	W	Paramount SB	4067	7.60	12.16	Diamond	19	No	2	X		X	
LA	60	W	Findlay	4069	4.94	7.90	Slip	14	No	2				X
LA	60	W	Atlantic NB	4070	4.49	7.18	Loop	18	No	2	X			
LA	60	W	Atlantic SB	4071	4.35	6.96	Diamond	20	No	2	X			
LA	60	W	Third St.	3130	2.47	3.95	Loop	33	No	2				
LA	60	W	Lorena	3126	1.47	2.35	Loop	22	No	1				
LA	60	W	Soto	3087	0.42	0.67	Loop	13	No	1				X
LA	71	S	Rio Rancho Rd.	4072	3.74	5.98	Split	50	No	2				X
LA	71	N	Ridgeway St.	5560	0.80	1.28	Slip	26	No	2		X	X	
LA	71	N	Rio Rancho Rd.	4073	3.74	5.98	Diamond	21	No	2		X	X	
LA	91	E	Main St	4513	7.16	11.46	Hook	34	No	2				
LA	91	E	Avalon	4076	7.81	12.50	Diamond	30	No	1				
LA	91	E	Central	4077	8.58	13.73	Diamond	22	No	3		X		
LA	91	E	Wilmington	4078	9.11	14.58	Diamond	18	No	3		X		
LA	91	E	Alameda	4079	10.13	16.21	Loop	30	No	2	X			
LA	91	E	Santa Fe	4080	10.48	16.77	Diamond	32	No	2				
LA	91	E	Long Beach	4081	11.03	17.65	Loop	14	No	1				

METERED ON-RAMP OPERATIONAL INVENTORY

Co.	Rte	Dir	Location	E No.	PM	KP	Ramp Type	Ramp Storage	Platoon Metering	Total Lanes	HOV Location		"Meter on" Sign (Loc.)	
											Left	Right	Left	Right
LA	91	E	Atlantic	3292	12.21	19.54	Diamond	18	No	1				
LA	91	E	Cherry	3293	13.26	21.22	Diamond	30	No	2				
LA	91	E	Paramount	3294	13.69	21.90	Diamond	22	No	2				
LA	91	E	Downey	4505	14.21	22.74	Diamond	22	No	2				
LA	91	E	Lakewood SB	3295	14.59	23.34	Hook	8	No	2	X			X
LA	91	E	Lakewood NB	3296	14.80	23.68	Diamond	32	No	2		X	X	
LA	91	E	Clark	3297	15.22	24.35	Diamond	12	No	2	X			
LA	91	E	Bellflower	3298	15.76	25.22	Diamond	15	No	2		X		
LA	91	E	Studebaker	3299	17.37	27.79	Diamond	32	No	2	X			
LA	91	E	Pioneer SB	3300	17.96	28.74	Hook	14	No	1			X	
LA	91	E	Pioneer NB	3301	18.21	29.14	Diamond	14	No	1				
LA	91	E	Norwalk SB	3302	18.54	29.66	Loop	12	No	1				
LA	91	E	Norwalk NB	3303	18.77	30.03	Diamond	15	No	1				X
LA	91	E	Shoemaker	3304	19.40	31.04	Hook	36	No	2				
LA	91	W	183rd/Carmenita	3316	20.14	32.22	Diamond	22	No	2				
LA	91	W	Artesia WB	3317	19.30	30.88	Diamond	13	No	2	X			
LA	91	W	Bloomfield	3318	19.06	30.50	Diamond	21	No	2				
LA	91	W	Norwalk NB	3319	18.70	29.92	Loop	10	No	1			X	
LA	91	W	Norwalk SB	3320	18.50	29.60	Diamond	21	No	1				
LA	91	W	Pioneer NB	3321	18.21	29.14	Hook	10	No	1			X	
LA	91	W	Pioneer SB	3322	17.96	28.74	Diamond	21	No	2	X			
LA	91	W	Bellflower	3323	15.54	24.86	Diamond	21	No	2				
LA	91	W	Lakewood NB	3324	14.65	23.44	Hook	8	No	2	X		X	
LA	91	W	Lakewood SB	3325	14.55	23.28	Diamond	21	No	2			X	
LA	91	W	Downey	3326	14.04	22.46	Diamond	12	No	2	X			
LA	91	W	Paramount	3327	13.51	21.62	Diamond	27	No	2				
LA	91	W	Cherry	3328	13.01	20.82	Diamond	12	No	2	X			
LA	91	W	Atlantic	3329	11.78	18.85	Diamond	18	No	2	X			
LA	91	W	Long Beach	4507	11.03	17.65	Diamond	14	No	2	X	X	X	
LA	91	W	Acacia St	4136	9.67	15.47	Diamond	12	No	2		X		
LA	91	W	Wilmington	4137	9.10	14.56	Diamond	18	No	1				
LA	91	W	Central	4138	8.27	13.23	Diamond	18	No	1				
LA	91	W	Avalon	4139	7.55	12.08	Loop	14	No	2				
LA	91	W	Main St	4506	6.94	11.10	Loop	24	No	1				
LA	101	S	Pkwy. Calabasas SB	5633	28.42	45.47	Loop	20	No	2			X	X
LA	101	S	Pkwy Calabasas NB	4177	28.20	45.12	Diamond	20	No	2	X		X	
LA	101	S	Valley circle	5005	27.40	43.84	Hook	7	No	2	X		X	X
LA	101	S	Mulholland	3407	27.26	43.62	Diamond	20	No	2	X		X	
LA	101	S	Ventura/Shoop	3408	25.67	41.07	Diamond	20	No	2				
LA	101	S	Topanga SB	3409	25.39	40.62	Loop	15	No	1			X	
LA	101	S	Topanga NB	3410	25.26	40.42	Diamond	10	No	1				
LA	101	S	Canoga	3411	24.76	39.62	Diamond	30	No	2				
LA	101	S	De soto	3412	24.23	38.77	Diamond	30	No	2				
LA	101	S	Winnetka	3413	23.22	37.15	Diamond	10	No	2	X			
LA	101	S	Van Alden	3414	22.07	35.31	Hook	10	Yes	1				X
LA	101	S	Burbank/ Reseda	3415	20.96	33.54	Diamond	15	No	2	X			
LA	101	S	White oak	3416	20.15	32.24	Diamond	20	No	2	X			
LA	101	S	Balboa	3417	19.00	30.40	Diamond	30	No	2	X			
LA	101	S	Hayvenhurst	3418	18.40	29.44	Diamond	20	No	2	X			
LA	101	S	Sepulveda Bl	3419	16.70	26.89	Diamond	25	No	2	X			
LA	101	S	Van Nuys Bl	3420	15.81	25.45	Diamond	30	No	2		X		
LA	101	S	Woodman Ave	3421	14.70	23.67	Diamond	20	No	2	X			
LA	101	S	Coldwater Canyon	3422	13.80	22.22	Diamond	25	No	2	X			
LA	101	S	Laurel Canyon Bl	-	12.75	20.53	Diamond	25	No	2	X		X	X
LA	101	S	Vineland	3171	11.15	17.95	Loop	30	No	1			X	
LA	101	S	Ventura	3170	10.48	16.87	Loop	10	No	1			X	
LA	101	S	Lankershim	3168	9.95	16.02	Hook	25	No	1				
LA	101	S	Highland Ave	3164	7.75	12.48	Hook	30	No	1				X
LA	101	S	Cahuenga	3163	7.27	11.70	Hook	30	No	1				X
LA	101	S	Argyle Ave	3162	6.99	11.25	Hook	30	No	2			X	
LA	101	S	Hollywood	3159	6.38	10.27	Hook	30	No	2	X		X	X
LA	101	S	Sunset	3277	6.10	9.82	Hook	40	No	2	X		X	
LA	101	S	Santa Monica	3278	5.45	8.77	Hook	12	No	2	X		X	X
LA	101	S	Melrose	3279	4.73	7.62	Hook	25	No	2	X		X	X

METERED ON-RAMP OPERATIONAL INVENTORY

Co.	Rte	Dir	Location	E No.	PM	KP	Ramp Type	Ramp Storage	Platoon Metering	Total Lanes	HOV Location		"Meter on" Sign (Loc.)	
											Left	Right	Left	Right
LA	101	S	Vermont Ave	3002	4.14	6.67	Diamond	40	No	2			X	
LA	101	S	Silverlake	3003	3.68	5.92	Hook	25	No	2	X		X	
LA	101	S	Rampart	3280	3.24	5.22	Hook	12	No	1			X	X
LA	101	S	Alvarado	3281	2.72	4.38	Hook	40	No	2				
LA	101	S	Glendale	3004	2.54	4.09	Hook	15	No	1				
LA	101	S	Los Angeles St	3291	0.64	1.03	Hook	30	No	2				
LA	101	N	Mission Rd	3001	0.19	0.31	Hook	20	No	1				
LA	101	N	Glendale	3284	2.42	3.90	Hook	5	No	1				
LA	101	N	Alvarado	3285	2.97	4.78	Hook	30	No	2				
LA	101	N	Rampart	3286	3.31	5.33	Hook	15	No	1				
LA	101	N	Silverlake	3287	3.86	6.21	Hook	25	No	1			X	
LA	101	N	Vermont	3288	4.53	7.29	Hook	20	No	2			X	X
LA	101	N	Normandie	3289	5.11	8.23	Hook	12	No	1			X	X
LA	101	N	Western	3290	5.95	9.58	Hook	20	No	1			X	
LA	101	N	Hollywood	3160	6.58	10.59	Hook	15	No	1				
LA	101	N	Argyle/Franklin	3161	7.20	11.59	Hook	20	No	2			X	X
LA	101	N	Cahuenga	3165	7.39	11.90	Hook	30	Yes	1				
LA	101	N	Universal Center Dr EB	4557	9.75	15.70	Loop	20	No	1				X
LA	101	N	Universal Center Dr WB	4556	9.85	15.86	Hook	35	No	1				X
LA	101	N	Lankershim	3169	10.53	16.95	Hook	50	No	2			X	X
LA	101	N	Moorpark	3172	11.53	18.56	Hook	25	No	1			X	X
LA	101	N	Tujunga	3397	12.00	19.32	Hook	22	No	1				
LA	101	N	Laurel Canyon Blvd	3398	12.90	20.77	Diamond	20	No	2				
LA	101	N	Coldwater Canyon	3399	13.98	22.51	Diamond	40	No	1				
LA	101	N	Woodman Ave	3400	15.00	24.15	Diamond	35	YES	1				
LA	101	N	Van Nuys Blvd	3401	16.01	25.78	Diamond	50	No	2				
LA	101	N	Haskell	3032	17.59	28.14	Loop	40	No	1				
LA	101	N	Balboa	3033	19.40	31.04	Diamond	20	Yes	1				
LA	101	N	White oak	3402	20.34	32.54	Diamond	20	No	1				
LA	101	N	Reseda	3403	21.40	34.24	Diamond	15	No	1				
LA	101	N	Tampa	3404	22.36	35.78	Diamond	15	Yes	1				
LA	101	N	Winnetka	3405	23.40	37.44	Diamond	30	No	1				
LA	101	N	De soto	3406	24.45	39.12	Diamond	40	No	2				
LA	101	N	Topanga	4154	25.70	41.12	Diamond	20	YES	1			X	X
LA	101	N	Woodlake	4157	26.90	43.04	Hook	8	No	1			X	X
LA	101	N	Calabasas Pkwy EB	3155	28.40	45.44	Loop	50	No	2			X	
LA	101	N	Calabasas Pkwy WB	4159	28.50	45.60	Diamond	20	No	1				
LA	105	E	Douglas St./Nash	5600	1.23	1.97	Hook	54	No	2			X	X
LA	105	E	Imperial/Aviation	4582	1.80	2.88	Hook	72	No	3	X		X	
LA	105	E	Hawthorne Bl	4807	3.10	4.96	Hook	77	No	2	X		X	
LA	105	E	Imperial/Prairie	4669	3.60	5.76	Hook	48	Yes	2	X		X	X
LA	105	E	Crenshaw SB / 120th St	4810	4.60	7.36	Hook	35	No	2	X		X	X
LA	105	E	Crenshaw NB	4812	4.90	7.84	Diamond	50	No	2	X		X	
LA	105	E	Hoover	4816	7.20	11.52	Diamond	32	No	2	X			
LA	105	E	Central Ave.	4835	9.00	14.40	Diamond	54	No	3	X		X	X
LA	105	E	Wilmington	4836	9.70	15.52	Hook	22	No	2	X		X	X
LA	105	E	Long Beach SB	4840	11.70	18.72	Loop	70	No	2	X		X	
LA	105	E	Long Beach NB	4841	11.90	19.04	Hook	45	No	2	X		X	
LA	105	E	Paramount	4578	14.80	23.68	Diamond	32	No	2			X	X
LA	105	E	Lakewood SB	4579	15.60	24.96	Hook	40	No	2	X		X	
LA	105	E	Lakewood NB	4581	15.90	25.44	Diamond	28	No	2	X		X	
LA	105	E	Bellflower	4582	16.80	26.88	Diamond	40	No	2	X		X	X
LA	105	W	Hoxie Ave	4668	17.90	28.64	Diamond	23	No	1			X	X
LA	105	W	Bellflower	4583	16.50	26.40	Diamond	37	No	2	X		X	X
LA	105	W	Lakewood	4580	15.60	24.96	Diamond	40	No	2	X		X	X
LA	105	W	Garfield Ave.(to WB105)	4833	14.20	22.72	Diamond	32	Yes	2	X		X	
LA	105	W	Garfield Ave. (to Rte710)	4832	14.10	22.56	Diamond	14	No	1			X	
LA	105	W	Long Beach Bl.NB	4839	11.60	18.56	Loop	18	No	2	X		X	
LA	105	W	Long Beach Bl.SB	4838	11.40	18.24	Hook	20	No	2	X		X	
LA	105	W	Wilmington Ave.	4837	10.10	16.16	Hook	32	No	3	X		X	X
LA	105	W	Central Ave.	4834	8.80	14.08	Diamond	36	No	3	X		X	X
LA	105	W	Vermont Ave.	4570	6.50	10.40	Diamond	25	No	2	X		X	X
LA	105	W	Crenshaw Bl. NB	4811	4.80	7.68	Loop	20	No	2	X		X	
LA	105	W	Crenshaw Bl. SB	4809	4.50	7.20	Diamond	41	No	2	X		X	

METERED ON-RAMP OPERATIONAL INVENTORY

Co.	Rte	Dir	Location	E No.	PM	KP	Ramp Type	Ramp Storage	Platoon Metering	Total Lanes	HOV Location		"Meter on" Sign (Loc.)	
											Left	Right	Left	Right
LA	105	W	Imperial/Prairie Ave.	4808	3.30	5.28	Diamond	27	No	2	X			
LA	110	S	Amador	3494	25.00	40.00	Diamond	10	No	1			X	
LA	110	S	Stadium Way	3493	24.46	39.14	Hook	35	No	1				
LA	110	S	3RD ST.	3492	23.05	36.88	Loop	20	Yes	1				
LA	110	S	8TH ST.	3490	22.31	35.70	Diamond	34	No	2				
LA	110	S	11TH ST.	3489	21.60	34.56	Diamond	12	Yes	1				
LA	110	S	37th / Exposition	3059	19.80	31.68	Diamond	14	No	2	X		X	X
LA	110	S	M.L. King Bl.	3060	19.37	30.99	Diamond	18	No	2	X		X	X
LA	110	S	Vernon	3061	18.89	30.22	Diamond	24	No	2				
LA	110	S	Slauson	3062	17.88	28.61	Diamond	13	No	2	X		X	X
LA	110	S	Gage	3063	17.30	27.68	Diamond	12	No	2		X		
LA	110	S	Florence/76th	3064	17.16	27.45	Diamond	12	No	2		X	X	
LA	110	S	Manchester WB	3065	16.02	25.63	Loop	12	No	2	X			X
LA	110	S	Manchester EB	3066	15.88	25.41	Diamond	12	No	2	X			X
LA	110	S	Imperial Hwy	3067	13.80	22.07	Diamond	26	No	2	X			X
LA	110	S	El Segundo	3068	12.78	20.45	Diamond	36	No	2				X
LA	110	S	Rosecrans	3069	11.73	18.77	Diamond	20	No	2			X	
LA	110	S	Redondo Beach	4443	11.11	17.78	Diamond	28	No	2	X		X	X
LA	110	N	Harbor	3828	1.05	1.68	Diamond	20	No	2				
LA	110	N	J. Gibson	3829	1.58	2.53	Hook	30	No	2				
LA	110	N	C St	3830	2.84	4.54	Hook	14	No	2	X			
LA	110	N	Anaheim St	3831	3.38	5.41	Hook	24	No	2				
LA	110	N	Pacific Coast Hwy	3832	4.17	6.67	Hook	30	No	2			X	X
LA	110	N	Sepulveda EB	3833	5.38	8.61	Loop	46	No	2				
LA	110	N	Sepulveda WB	3834	5.60	8.96	Diamond	12	No	2	X			
LA	110	N	220th St	3835	6.84	10.94	Hook	16	No	2	X			X
LA	110	N	Torrance	3836	7.98	12.77	Hook	38	Yes	1				
LA	110	N	190th St	3173	9.21	14.74	Diamond	10	No	2	X			
LA	110	N	Redondo Beach	4444	11.22	17.95	Loop	24	No	2				X
LA	110	N	Rosecrans EB	3176	11.83	18.93	Loop	14	No	2	X			X
LA	110	N	Rosecrans WB	3177	11.97	19.15	Diamond	35	No	2	X			X
LA	110	N	El Segundo	3178	12.86	20.58	Loop	30	No	2				X
LA	110	N	Imperial Hwy.	3179	14.29	22.86	Diamond	12	No	2		X		
LA	110	N	Century	3180	15.10	24.16	Diamond	18	No	2	X			
LA	110	N	Manchester EB	3181	15.88	25.41	Loop	14	No	2	X			X
LA	110	N	Manchester WB	3182	15.89	25.42	Diamond	28	No	2	X			X
LA	110	N	Florence	3183	17.13	27.41	Diamond	12	No	2	X			X
LA	110	N	Gage	3184	17.68	28.29	Diamond	14	No	2	X		X	X
LA	110	N	Slauson	3185	17.97	28.75	Loop	14	No	2	X		X	X
LA	110	N	51st	3186	18.64	29.82	Diamond	12	No	1			X	X
LA	110	N	Vernon	3187	19.16	30.66	Diamond	10	No	1	X	X		
LA	110	N	M.L. King Bl.	3188	19.47	31.15	Loop	14	No	2				X
LA	110	N	Exposition	3189	20.14	32.22	Diamond	16	No	2				
LA	110	N	Washington	3190	21.36	34.18	Hook	14	No	1				
LA	110	N	3RD ST.	-	23.23	37.17	Diamond	10	No	1				X
LA	110	N	Stadium Way	-	24.76	39.62	Loop	18	No	1				X
LA	118	E	Topanga Cyn.	3528	1.95	3.12	Diamond	20	No	1	X		X	X
LA	118	E	Desoto Ave.	3527	2.86	4.58	Diamond	30	No	2			X	X
LA	118	E	Porter Ranch Dr.	3526	3.80	6.08	Diamond	40	No	2		X	X	X
LA	118	E	Tampa Ave.	3525	4.79	7.66	Diamond	30	No	2			X	X
LA	118	E	Reseda Blvd.	3524	5.97	9.55	Diamond	38	No	2			X	X
LA	118	E	Balboa Bl. SB	3523	7.61	12.18	Loop	25	No	1	X			X
LA	118	E	Balboa Bl. NB	3522	7.99	12.78	Diamond	15	No	1	X		X	X
LA	118	E	Hayvenhurst Ave	3521	8.58	13.73	Diamond	22	No	1	X		X	X
LA	118	E	Sepulveda	3615	9.60	15.36	Diamond	40	No	2			X	X
LA	118	E	San Fernando	3619	12.31	19.70	Diamond	30	No	1				X
LA	118	W	San Fernando	3618	12.30	19.68	Diamond	60	No	2				X
LA	118	W	Laurel Cyn.	3617	11.60	18.56	Diamond	35	No	2			X	X
LA	118	W	Sepulveda	3616	9.96	15.94	Diamond	40	No	2			X	X
LA	118	W	Woodley Ave.	3529	8.85	14.16	Diamond	40	No	2			X	X
LA	118	W	Balboa Blvd.	3520	7.80	12.48	Diamond	45	No	2				X
LA	118	W	Reseda Blvd.	3519	5.65	9.04	Hook	45	No	2			X	X
LA	118	W	Tampa Ave.	3518	4.46	7.14	Diamond	50	No	2			X	X
LA	118	W	Porter Ranch Dr.	3517	3.86	6.18	Diamond	35	No	2			X	X

METERED ON-RAMP OPERATIONAL INVENTORY

Co.	Rte	Dir	Location	E No.	PM	KP	Ramp Type	Ramp Storage	Platoon Metering	Total Lanes	HOV Location		"Meter on" Sign (Loc.)	
											Left	Right	Left	Right
LA	118	W	Desoto Ave.	3516	2.72	4.35	Loop	20	No	2				X
LA	118	W	Topanga Cyn.	3515	1.65	2.64	Diamond	35	No	2			X	X
VEN	118	E	New Los Angeles	4572	11.47	18.35	Loop	70	No	2			X	
VEN	118	E	Princeton Ave	4575	19.60	31.36	Diamond	50	No	2	X		X	
VEN	118	E	CollinsDr.	4577	20.60	32.96	Loop	55	No	2	X			
VEN	118	E	Madera Rd. SB	4818	22.90	36.64	Loop	25	No	1			X	
VEN	118	E	Madera Rd. NB	4550	23.20	37.12	Diamond	40	No	2			X	X
VEN	118	E	First St. SB	4548	23.78	38.05	Loop	25	No	1	X			X
VEN	118	E	First St. NB	4546	23.97	38.35	Diamond	25	No	1	X		X	
VEN	118	E	Erringer Rd. SB	4544	24.78	39.65	Loop	25	No	1	X		X	
VEN	118	E	Erringer Rd. NB	4542	24.97	39.95	Diamond	25	No	1	X		X	
VEN	118	E	Sycamore Dr. SB	4540	25.78	41.25	Loop	25	No	1	X			X
VEN	118	E	Sycamore Dr. NB	4538	25.89	41.42	Diamond	25	No	1	X		X	
VEN	118	E	Tapo Cyn. SB	4536	27.20	43.52	Loop	25	No	1	X			X
VEN	118	E	Tapo Cyn. NB	4534	27.40	43.84	Diamond	25	No	1	X		X	
VEN	118	E	Stearns St. SB	4532	28.70	45.92	Loop	25	No	1	X			X
VEN	118	E	Stearns St. NB	4530	28.90	46.24	Diamond	22	No	1	X		X	
VEN	118	E	Yosemite Ave. SB	4528	29.53	47.25	Loop	25	No	1	X			X
VEN	118	E	Yosemite Ave. NB	4526	29.73	47.57	Diamond	22	No	1	X		X	
VEN	118	E	Kuehner Dr.	4524	30.82	49.31	Diamond	40	No	1	X		X	
VEN	118	E	Rockey Peak Rd.	4523	32.53	52.05	Diamond	15	No	1	X		X	
VEN	118	W	Kuehner Dr.	4525	30.38	48.61	Diamond	30	No	1	X			X
VEN	118	W	Yosemite Ave. SB	4529	29.50	47.20	Diamond	50	No	1	X		X	
VEN	118	W	Yosemite Ave. NB	4527	29.50	47.20	Loop	50	No	1	X		X	
VEN	118	W	Stearns St. SB	4533	28.86	46.18	Diamond	50	No	1	X		X	
VEN	118	W	Stearns St. NB	4531	28.80	46.08	Loop	50	No	1	X			X
VEN	118	W	Tapo Cyn. SB	4537	27.30	43.68	Diamond	50	No	1	X			X
VEN	118	W	Tapo Cyn. NB	4535	27.30	43.68	Loop	50	No	1	X			X
VEN	118	W	Sycamore Dr. SB	4541	25.83	41.33	Diamond	50	No	1	X		X	
VEN	118	W	Sycamore Dr. NB	4539	25.83	41.33	Loop	50	No	1	X			X
VEN	118	W	Erringer Rd. SB	4545	24.93	39.89	Diamond	50	No	1	X		X	
VEN	118	W	Erringer Rd. NB	4543	24.80	39.68	Loop	50	No	1	X			X
VEN	118	W	First St. SB	4549	23.63	37.81	Diamond	50	No	1	X		X	
VEN	118	W	First St. NB	4547	23.63	37.81	Loop	50	No	1	X		X	
VEN	118	W	Madera Rd.	4819	22.86	36.58	Diamond	40	No	1		X		X
VEN	118	W	CollinsDr.	4576	19.87	31.79	Diamond	50	No	1	X		X	
VEN	118	W	Princeton Ave	4574	19.75	31.60	Diamond	50	No	1	X			X
VEN	118	W	New Los Angeles	4573	10.98	17.57	Diamond	70	No	2			X	X
LA	134	E	Vineland	3106	0.49	0.79	Hook	32	No	1			X	X
LA	134	E	Cahuenga	3107	0.95	1.53	Diamond	28	No	1			X	X
LA	134	E	Hollywood Way	3108	2.11	3.40	Hook	29	No	1			X	X
LA	134	E	Buena Vista	3109	3.04	4.89	Diamond	45	No	1			X	X
LA	134	E	Forest Lawn	3110	3.87	6.23	Diamond	28	No	1			X	
LA	134	E	San Fernando Rd	4191	6.10	9.82	Hook	15	No	1				
LA	134	E	Pacific	4192	6.66	10.72	Diamond	23	No	1			X	X
LA	134	E	Brand	4194	7.22	11.62	Diamond	30	No	2			X	X
LA	134	E	Glendale SB	4195	7.84	12.62	Loop	6	No	2	X			
LA	134	E	Glendale NB	4196	7.96	12.82	Diamond	15	No	2	X			X
LA	134	E	Harvey	4197	9.07	14.60	Diamond	18	No	2	X			
LA	134	E	Figueroa	4201	11.53	18.56	Hook	21	No	1			X	
LA	134	E	Colorado	4200	11.64	18.74	Diamond	16	No	2	X			
LA	134	E	San Rafael	4202	12.45	20.04	Diamond	21	No	1				
LA	134	E	Orange Grove	4203	13.18	21.22	Hook	48	No	1			X	X
LA	134	W	Fair Oaks	4311	13.34	21.48	Diamond	16	No	2	X	X		
LA	134	W	Orange Grove	4209	12.78	20.58	Hook	33	No	1			X	X
LA	134	W	San Rafael	4210	12.27	19.75	Diamond	20	No	1				
LA	134	W	Figueroa	4211	11.50	18.52	Hook	14	No	2				
LA	134	W	Harvey	4213	8.58	13.81	Diamond	32	No	2			X	X
LA	134	W	Glendale	4215	7.69	12.38	Hook	23	Yes	1				
LA	134	W	Central	3113	6.88	11.08	Diamond	24	No	2			X	X
LA	134	W	Pacific	3112	6.50	10.47	Diamond	16	No	1			X	X
LA	134	W	San Fernando Rd	3111	6.00	9.66	Hook	15	No	1				
LA	134	W	Victory	3498	4.73	7.62	Diamond	30	No	2			X	X
LA	134	W	Forest Lawn	3497	3.75	6.04	Diamond	23	No	1			X	X

METERED ON-RAMP OPERATIONAL INVENTORY

Co.	Rte	Dir	Location	E No.	PM	KP	Ramp Type	Ramp Storage	Platoon Metering	Total Lanes	HOV Location		"Meter on" Sign (Loc.)	
											Left	Right	Left	Right
LA	134	W	Buena Vista	3496	2.86	4.60	Diamond	24	No	2			X	X
LA	134	W	Alameda	3495	1.95	3.14	Diamond	44	No	2				
LA	170	S	Arleta	3498	20.27	32.43	Hook	20	No	2			X	X
LA	170	S	Roscoe WB	3500	19.80	31.68	Loop	7	No	1			X	
LA	170	S	Roscoe EB	3501	19.62	31.39	Diamond	33	No	2			X	X
LA	170	S	Sherman Way	3386	18.19	29.10	Diamond	25	No	2			X	X
LA	170	S	Victory Blvd. WB	3387	17.30	27.68	Loop	10	No	1			X	
LA	170	S	Victory Bl EB	3388	17.16	27.46	Diamond	15	No	2		X	X	
LA	170	S	Oxnard Bl.	3389	16.60	26.56	Diamond	7	No	2	X		X	X
LA	170	S	Burbank Bl.	3390	15.96	25.54	Diamond	11	No	2	X		X	X
LA	170	S	Magnolia	3391	15.26	24.42	Diamond	18	No	2	X		X	X
LA	210	E	Arroyo	4243	22.64	36.45	Diamond	17	No	2		X		X
LA	210	E	Lincoln	4244	23.25	37.43	Hook	23	No	2	X			X
LA	210	E	Mountain St	4245	24.22	38.99	Diamond	25	No	2	X			
LA	210	E	Marengo	4522	25.74	41.44	Diamond	60	No	2				
LA	210	E	Lake	4248	26.49	42.65	Diamond	45	No	2				X
LA	210	E	Hill	4249	27.16	43.73	Diamond	29	No	2	X			X
LA	210	E	Allen	4250	27.65	44.52	Diamond	33	No	2	X		X	
LA	210	E	San Gabriel	4251	28.70	46.21	Diamond	18	No	2	X			
LA	210	E	Sierra Madre Villa	4252	29.46	47.43	Diamond	21	No	2	X			X
LA	210	E	Rosemead	4253	29.74	47.88	Diamond	31	No	2		X	X	
LA	210	E	Michillinda	4254	30.01	48.32	Hook	54	No	2	X			X
LA	210	E	Baldwin	4255	30.95	49.83	Diamond	30	No	2			X	
LA	210	E	Santa Anita	4256	32.06	51.62	Diamond	35	No	2			X	
LA	210	E	Huntington WB	4257	32.86	52.90	Loop	16	No	1				X
LA	210	E	Huntington EB	4258	33.05	53.21	Diamond	38	No	2			X	
LA	210	E	Myrtle	4259	34.15	54.98	Diamond	17	No	2			X	
LA	210	E	Mountain	4260	35.20	56.67	Diamond	27	No	2			X	
LA	210	E	Buena Vista	4261	35.38	56.96	Diamond	25	No	2			X	
LA	210	E	Mt Olive	4262	36.41	58.62	Loop	44	No	2	X			X
LA	210	E	Irwindale	4264	38.01	61.20	Diamond	40	No	2	X		X	X
LA	210	E	Vernon	4265	39.15	63.03	Diamond	18	No	2	X		X	X
LA	210	E	Azusa SB	4266	39.70	63.92	Loop	19	No	2	X		X	
LA	210	E	Azusa NB	4267	39.71	63.93	Diamond	15	No	2	X		X	
LA	210	E	Citrus SB	4268	40.56	65.30	Loop	21	No	2	X		X	
LA	210	E	Citrus NB	4269	40.74	65.59	Diamond	22	No	1				X
LA	210	E	Grand	4270	41.80	67.30	Diamond	28	No	2	X		X	
LA	210	E	Sunflower	4271	43.39	69.86	Diamond	29	No	2	X		X	X
LA	210	E	Lone Hill	4451	44.20	71.16	Diamond	29	No	2	X		X	X
LA	210	E	Foothill	-	47.00	75.67	Hook	42	No	2			X	X
LA	210	E	Fruit	-	48.20	77.60	Diamond	32	No	2			X	X
LA	210	E	Towne	-	49.63	79.90	Diamond	38	No	2			X	X
LA	210	E	Baseline	-	51.85	83.48	Diamond	40	No	2			X	X
LA	210	W	Baseline	-	51.94	83.62	Loop	52	No	2			X	X
LA	210	W	Towne	-	49.40	79.53	Diamond	24	No	2			X	X
LA	210	W	Fruit	-	48.00	77.28	Diamond	52	No	2			X	X
LA	210	W	Foothill NB	-	45.17	72.72	Loop	36	No	2			X	X
LA	210	W	Foothill SB	-	45.06	72.55	Diamond	38	No	2	X			X
LA	210	W	Lone Hill	4283	44.10	71.00	Diamond	16	No	2	X		X	X
LA	210	W	Sunflower	4285	43.10	69.39	Diamond	14	No	2	X		X	X
LA	210	W	Grand - Baseline	4286	41.63	67.02	Hook	54	No	2			X	X
LA	210	W	Grand	4287	41.47	66.77	Diamond	20	No	2	X		X	
LA	210	W	Citrus	4288	40.28	64.85	Hook	52	No	2			X	X
LA	210	W	Azusa NB	4290	39.62	63.79	Hook	18	No	2			X	X
LA	210	W	Azusa SB	4289	39.45	63.51	Diamond	26	No	1				X
LA	210	W	Vernon	4291	38.87	62.58	Diamond	28	No	2	X		X	X
LA	210	W	Irwindale	4292	37.92	61.05	Loop	21	No	2	X		X	
LA	210	W	Irwindale SB	4293	37.78	60.83	Diamond	27	No	2	X			X
LA	210	W	Mount Olive	4294	36.21	58.30	Hook	33	No	2	X		X	
LA	210	W	Buena Vista	4296	34.95	56.27	Diamond	19	No	2	X		X	X
LA	210	W	Mountain	4297	34.58	55.67	Diamond	25	No	2	X		X	X
LA	210	W	Myrtle	4298	33.76	54.35	Diamond	12	No	2	X		X	
LA	210	W	Huntington	4299	32.76	52.74	Hook	26	No	2	X			X
LA	210	W	Santa Anita NB	4300	31.91	51.38	Loop	45	No	2				

METERED ON-RAMP OPERATIONAL INVENTORY

Co.	Rte	Dir	Location	E No.	PM	KP	Ramp Type	Ramp Storage	Platoon Metering	Total Lanes	HOV Location		"Meter on" Sign (Loc.)	
											Left	Right	Left	Right
LA	210	W	Santa Anita SB	4301	31.73	51.09	Diamond	21	No	2		X	X	
LA	210	W	Baldwin NB	4302	30.71	49.44	Loop	14	No	2	X		X	
LA	210	W	Baldwin - Foothill	4303	30.49	49.09	Hook	30	No	2				X
LA	210	W	Michillinda	4516	29.85	48.06	Loop	19	No	2				X
LA	210	W	Foothill - Rosemead	4304	29.72	47.85	Hook	17	No	2				X
LA	210	W	Rosemead	4569	29.59	47.64	Diamond	10	No	2	X		X	
LA	210	W	Sierra Madre Villa	4305	29.19	47.00	Diamond	18	No	1			X	
LA	210	W	San Gabriel	4306	28.29	45.55	Diamond	23	No	2	X			
LA	210	W	Altadena	4307	28.05	45.16	Diamond	26	No	2	X			
LA	210	W	Hill	4308	26.82	43.18	Diamond	28	No	2			X	
LA	210	W	Lake	4309	26.14	42.09	Diamond	42	No	2			X	
LA	210	W	Walnut	4312	24.83	39.98	Diamond	22	No	2	X		X	
LA	210	W	Mountain St	4314	23.89	38.46	Diamond	33	No	2				
LA	210	W	Lincoln	4315	23.00	37.03	Diamond	38	No	1				
LA	210	W	Arroyo	4317	22.29	35.89	Diamond	54	No	1				
LA	405	S	Rinaldi St	4376	47.62	76.67	Diamond	14	No	2			X	X
LA	405	S	San Fernando Mission Rd	4377	47.28	76.12	Loop	30	No	2			X	X
LA	405	S	Devonshire St WB	3502	46.28	74.51	Hook	5	No	1			X	
LA	405	S	Devonshire St EB	3503	46.10	74.22	Diamond	40	No	2			X	
LA	405	S	Nordoff St	3505	44.62	71.84	Hook	40	No	2			X	
LA	405	S	Roscoe Blvd	3507	43.61	70.21	Hook	40	No	2			X	
LA	405	S	Sherman Way WB	3508	42.40	68.26	Loop	40	No	2	X		X	
LA	405	S	Sherman Way EB	3510	42.25	68.02	Hook	30	No	1	X		X	
LA	405	S	Victory Blvd WB	3394	41.48	66.78	Hook	12	No	1				
LA	405	S	Victory Blvd EB	3395	41.31	66.51	Loop	25	No	1			X	
LA	405	S	Burbank Blvd	3396	40.08	64.53	Hook	25	No	1				
LA	405	S	Ventura Bl.	3513	39.09	62.54	Loop	10	No	2	X		X	
LA	405	S	Valley Vista Bl.	3514	38.42	61.47	Angle	50	No	2			X	
LA	405	S	Skirball/Muholland Dr.	3385	36.25	58.34	Angle	12	No	2			X	
LA	405	S	Getty Center Dr.	3424	34.73	55.57	Angle	10	No	2	X		X	
LA	405	S	Sunset WB/Church Ln	3425	33.05	52.88	Loop	10	No	1				
LA	405	S	Sunset Bl. EB	3191	32.90	52.64	Angle	12	No	2	X			
LA	405	S	Waterford St.	3426	32.11	51.38	Hook	8	No	1				
LA	405	S	Wilshire Bl. WB	3427	31.66	50.66	Loop	20	No	2				
LA	405	S	Wilshire Bl. EB	3428	31.39	50.22	Hook	25	No	1			X	
LA	405	S	Santa Monica Bl.	3429	30.80	49.28	Angle	20	No	2			X	
LA	405	S	National Bl.	3192	29.16	46.66	Angle	20	No	2			X	
LA	405	S	Venice Bl.	3193	27.81	44.50	Hook	15	No	1			X	
LA	405	S	Braddock Dr.	3194	26.84	42.94	Angle	20	No	1			X	
LA	405	S	Jefferson Bl.	3195	25.83	41.33	Angle	20	No	1			X	
LA	405	S	Howard Hughes Pkwy.	3196	25.00	40.00	Hook	50	No	2			X	
LA	405	S	La Tijera Bl.	3359	24.25	38.80	Angle	12	No		X		X	
LA	405	S	La Cienaga Bl.	3360	23.61	37.78	Hook	50	No	1			X	
LA	406	S	Centruy Bl. WB /98th St.	3362	22.02	35.44	Hook	14	No	2			X	
LA	405	S	Manchester WB / Olive St	3361	22.34	35.74	Hook	25	No	2	X			
LA	405	S	Century Bl. EB	3363	22.00	35.20	Hook	12	No	2			X	
LA	405	S	Imperial Hwy. WB	3364	21.30	34.08	Hook	20	No	2	X		X	
LA	405	S	Imperial Hwy. EB	3365	21.08	33.73	Hook	25	No	2	X		X	
LA	405	S	EI Segundo WB	4521	20.60	32.96	Hook	15	No	2	X		X	
LA	405	S	EI Segundo EB	3366	20.30	32.48	Hook	20	No	2	X		X	
LA	405	S	Rosecrans	3367	19.16	30.66	Hook	25	No	1			X	
LA	405	S	Inglewood SB	3368	18.30	29.28	Loop	20	No	2	X		X	
LA	405	S	Inglewood NB	3369	18.20	29.12	Hook	15	No	2	X		X	
LA	405	S	Hawthorne	3370	17.64	28.22	Loop	20	No	2	X		X	
LA	405	S	Artesia	3371	16.47	26.35	Angle	25	No	2			X	
LA	405	S	Crenshaw	3372	15.51	24.82	Loop	30	No	1			X	
LA	405	S	190th/Western	3373	14.52	23.23	Hook	25	No	1			X	
LA	405	S	Normandie	3374	13.69	21.90	Angle	10	No	2	X		X	
LA	405	S	Main St	3073	12.57	20.24	Diamond	30	No	2	X		X	
LA	405	S	Avalon	3074	11.32	18.23	Loop	30	No	2	X		X	
LA	405	S	Carson	3075	10.49	16.89	Hook	36	No	2	X		X	
LA	405	S	Wilmington	3082	9.47	15.25	Diamond	26	No	2			X	
LA	405	S	Alameda	3077	8.63	13.89	Hook	18	No	2			X	
LA	405	S	Santa Fe	3078	8.05	12.96	Hook	28	No	2				

METERED ON-RAMP OPERATIONAL INVENTORY

Co.	Rte	Dir	Location	E No.	PM	KP	Ramp Type	Ramp Storage	Platoon Metering	Total Lanes	HOV Location		"Meter on" Sign (Loc.)	
											Left	Right	Left	Right
LA	405	S	Long Beach	3029	6.42	10.34	Loop	34	No	2				
LA	405	S	Atlantic SB	3028	6.15	9.90	Loop	30	No	1				
LA	405	S	Atlantic NB	3026	6.00	9.66	Hook	28	No	1				
LA	405	S	Orange	3024	5.38	8.66	Loop	20	No	2	X			
LA	405	S	Cherry SB	3022	4.81	7.74	Loop	26	No	1			X	
LA	405	S	Spring	3019	4.47	7.20	Diamond	20	No	2	X			X
LA	405	S	Lakewood SB	3017	3.47	5.59	Loop	24	No	2	X		X	
LA	405	S	Willow	3015	2.97	4.78	Hook	23	No	2	X		X	
LA	405	S	Bellflower SB	3013	2.45	3.94	Loop	34	No	1			X	
LA	405	S	Bellflower NB	3011	2.11	3.40	Hook	14	No	1				X
LA	405	S	Woodruff	3009	1.50	2.42	Diamond	36	No	1				X
LA	405	S	Stearns	3007	0.90	1.45	Diamond	24	No	2	X		X	
LA	405	N	Studebaker	3006	0.55	0.89	Hook	22	No	1				X
LA	405	N	Palo Verde	3008	1.10	1.77	Loop	16	No	1			X	
LA	405	N	Woodruff	3010	1.73	2.79	Hook	26	No	1				X
LA	405	N	Bellflower NB	3012	2.16	3.48	Loop	22	No	2			X	
LA	405	N	Bellflower SB	3014	2.45	3.94	Hook	30	No	1				
LA	405	N	Lakewood NB	3019	3.28	5.28	Diamond	40	Yes	2	X		X	
LA	405	N	Lakewood SB	3018	3.44	5.54	Diamond	24	No	2	X		X	
LA	405	N	Spring	3020	4.57	7.36	Diamond	18	No	2	X		X	
LA	405	N	Cherry NB	3021	4.81	7.74	Loop	10	No	1			X	
LA	405	N	Cherry SB	3023	4.92	7.92	Hook	20	No	1			X	
LA	405	N	Orange	3025	5.46	8.79	Hook	24	No	1			X	
LA	405	N	Atlantic NB	3027	5.99	9.64	Loop	18	No	1			X	
LA	405	N	Wardlow	3030	6.56	10.56	Diamond	24	No	2		X		X
LA	405	N	Pacific Pl	-	7.22	11.62	Hook	30	No	2		X		X
LA	405	N	Santa Fe	3079	8.02	12.91	Hook	25	No	2				X
LA	405	N	Alameda	3080	8.69	13.99	Loop	28	No	2				X
LA	405	N	Wilmington	3081	9.47	15.25	Loop	26	No	1			X	X
LA	405	N	Carson	3082	10.70	17.23	Hook	40	No	1			X	
LA	405	N	Avalon	3083	11.32	18.23	Hook	24	No	2				X
LA	405	N	Vermont	3046	13.31	21.30	Angle	10	No	2	X		X	X
LA	405	N	Normandie	3047	13.81	22.10	Loop	25	No	1				X
LA	405	N	Western	3048	14.34	22.94	Loop	20	No	1				X
LA	405	N	Crenshaw	3049	15.43	24.69	Hook	15	No	1				X
LA	405	N	Artesia	3050	16.66	26.66	Hook	25	No	1		X		X
LA	405	N	Redondo Beach	3051	17.01	27.22	Angle	15	No	1				X
LA	405	N	Hawthorne	3052	17.52	28.03	Loop	10	No	3	X			X
LA	405	N	Inglewood NB	3053	18.20	29.12	Loop	15	No	2	X		X	
LA	405	N	Inglewood SB	3054	18.35	29.36	Angle	10	No	2	X		X	
LA	405	N	Rosecrans EB	3055	19.16	30.66	Loop	15	No	1				X
LA	405	N	Rosecrans WB	3056	19.36	30.98	Angle	25	No	1			X	
LA	405	N	El Segundo EB	3057	20.13	32.21	Loop	15	No	2	X			X
LA	405	N	El Segundo WB	3058	20.39	32.62	Hook	15	No	2	X			X
LA	405	N	Imperial Hwy. EB	3353	21.10	33.76	Loop	25	No	2	X			X
LA	405	N	Imperial Hwy. WB	3352	21.39	34.22	Hook	20	No	2	X			X
LA	405	N	Century Bl. EB	3354	22.68	36.29	Loop	15	No	2	X			X
LA	405	N	Century Bl. WB	3355	22.70	36.32	Angle	25	No	2		X		X
LA	405	N	Manchester EB	3356	23.36	37.38	Loop	25	No	2	X		X	
LA	405	N	Manchester Bl. WB	3357	23.47	37.55	Angle	24	No	2				X
LA	405	N	La Tijera Bl.	3358	24.25	38.80	Angle	30	No	2	X		X	X
LA	405	N	Howard Hughes Pkwy.	4555	24.80	39.68	Hook	35	No	2	X			X
LA	405	N	Jefferson Bl.	3197	26.00	41.60	Angle	12	No	2		X		X
LA	405	N	Braddock Dr.	3198	26.85	42.96	Angle	20	No	1				X
LA	405	N	Culver Bl.	3199	27.35	43.76	Angle	20	No	2	X		X	
LA	405	N	Venice Bl.	3200	27.81	44.50	Hook	15	No	1				
LA	405	N	Pico / Olympic Bl.	3201	30.13	48.21	Hook	20	No	2		X		X
LA	405	N	Santa Monica Bl.	3202	30.95	49.52	Angle	30	No	2				
LA	405	N	Wilshire Bl. EB	3203	31.48	50.37	Loop	15	No	1				X
LA	405	N	Wilshire Bl. WB	3204	31.57	50.51	Hook	20	No	1				
LA	405	N	Sunset Bl. EB	3205	32.96	52.74	Loop	20	No	1				X
LA	405	N	Moraga Ave	3206	33.42	53.47	Hook	10	No	2	X	X		X
LA	405	N	Getty Center Dr.	3207	34.71	55.54	Loop	30	No	1				X
LA	405	N	Skirball/Muholland Dr.	3208	36.93	59.09	Hook	20	No	1				

METERED ON-RAMP OPERATIONAL INVENTORY

Co.	Rte	Dir	Location	E No.	PM	KP	Ramp Type	Ramp Storage	Platoon Metering	Total Lanes	HOV Location		"Meter on" Sign (Loc.)	
											Left	Right	Left	Right
LA	405	N	Valley Vista Bl.	3392	38.74	61.98	Hook	18	No	2				
LA	405	N	Ventura Bl.	3393	38.97	62.35	Loop	8	No	2	X			
LA	405	N	Burbank Bl	3512	40.42	65.08	Hook	24	No	2			X	X
LA	405	N	Victory Bl	3511	41.49	66.80	Hook	20	No	2			X	X
LA	405	N	Sherman Way	3509	42.59	68.57	Hook	30	No	2				X
LA	405	N	Roscoe Bl	3506	43.93	70.73	Diamond	50	No	2				X
LA	405	N	Nordoff St	3504	44.92	72.32	Diamond	60	No	2				X
LA	405	N	Devonshire St EB	4372	46.44	74.77	Loop	40	No	1				X
LA	405	N	Devonshire St WB	3472	46.43	74.75	Hook	40	No	1				X
LA	405	N	Rinaldi St	4373	47.94	77.18	Diamond	50	No	2				X
LA	605	S	Live Oak	4432	23.35	37.59	Diamond	38	No	2				
LA	605	S	Lower Azusa	4433	21.95	35.34	Diamond	40	No	2				
LA	605	S	Ramona	4426	20.88	33.62	Diamond	16	No	2		X	X	X
LA	605	S	Valley WB	4436	19.30	31.07	Loop	124	No	2			X	X
LA	605	S	Valley EB	4437	19.29	31.06	Par-clo	26	No	1				X
LA	605	S	Peck NB	3341	16.75	26.97	Hook	16	No	1				
LA	605	S	Peck SB	3342	16.54	26.63	Diamond	42	No	2		X	X	
LA	605	S	Rose Hills	3343	15.45	24.87	Hook	8	No	1				
LA	605	S	Beverly WB	3344	14.31	23.04	Loop	13	No	1			X	
LA	605	S	Beverly EB	3345	14.30	23.02	Par-clo	14	No	2		X	X	
LA	605	S	Whittier WB	3346	13.61	21.91	Loop	20	No	1			X	
LA	605	S	Whittier EB	3347	13.44	21.64	Diamond	20	No	2		X	X	
LA	605	S	Washington WB	3348	11.97	19.27	Loop	17	No	1			X	
LA	605	S	Washington EB	3349	11.96	19.26	Diamond	14	No	2		X	X	
LA	605	S	Slauson EB	3350	11.49	18.50	Hook	14	No	2		X	X	
LA	605	S	Telegraph	3351	10.32	16.62	Loop	30	No	2				
LA	605	S	Florence	3377	9.16	14.75	Diamond	38	No	2				
LA	605	S	Firestone	3378	8.34	13.43	Diamond	39	No	2	X			
LA	605	S	Imperial	3379	7.90	12.72	Loop	48	No	2			X	
LA	605	S	Rosecrans WB	3381	6.84	11.01	Loop	22	No	2		X	X	
LA	605	S	Rosecrans EB	3382	6.72	10.82	Hook	20	No	2		X	X	
LA	605	S	Alondra WB	3383	5.85	9.42	Loop	18	No	1			X	
LA	605	S	Alondra EB	3384	5.74	9.24	Diamond	16	No	2		X	X	
LA	605	S	South WB	3442	3.83	6.17	Loop	20	No	2	X		X	
LA	605	S	South EB	3443	3.68	5.92	Loop	26	No	2	X		X	
LA	605	S	Del Amo WB	3444	2.93	4.72	Loop	14	No	1			X	
LA	605	S	Del Amo EB	3445	2.79	4.49	Loop	16	No	2		X	X	
LA	605	S	Carson WB	3446	1.85	2.98	Loop	16	No	1		X	X	
LA	605	S	Carson EB	3447	1.67	2.69	Loop	28	No	2			X	
LA	605	N	Spring St	3435	0.23	0.37	Loop	18	No	1			X	
LA	605	N	Carson EB	3436	1.70	2.74	Loop	16	No	1			X	
LA	605	N	Carson WB	3437	1.91	3.08	Diamond	18	No	2	X		X	
LA	605	N	Del Amo EB	3438	2.81	4.52	Loop	12	No	1		X	X	
LA	605	N	Del Amo WB	3439	2.96	4.77	Diamond	16	No	2	X		X	
LA	605	N	South EB	3440	3.71	5.97	Loop	14	No	1			X	
LA	605	N	South WB	3441	3.86	6.21	Diamond	16	No	1			X	
LA	605	N	Alondra EB	3244	5.77	9.29	Loop	18	No	1			X	
LA	605	N	Alondra WB	3245	5.92	9.53	Loop	20	No	2	X		X	
LA	605	N	Rosecrans to (WB-105)	3246	6.79	10.93	Loop	23	No	1			X	X
LA	605	N	Rosecrans WB	3247	6.93	11.16	Hook	25	No	2		X	X	
LA	605	N	Imperial	3248	7.80	12.56	Hook	24	No	2	X		X	
LA	605	N	Firestone	3249	8.50	13.69	Par-clo	22	No	2	X		X	
LA	605	N	Florence	3250	9.30	14.97	Hook	21	No	2		X	X	
LA	605	N	Telegraph	3333	10.40	16.74	Par-clo	23	No	2		X	X	X
LA	605	N	Washington EB	3334	12.22	19.67	Hook	10	No	1				
LA	605	N	Saragosa	3335	12.57	20.24	Diamond	21	No	2		X	X	X
LA	605	N	Whittier EB	3336	13.51	21.75	Loop	20	No	1			X	
LA	605	N	Whittier WB	3337	13.64	21.96	Diamond	17	No	2		X	X	
LA	605	N	Beverly	3338	14.60	23.51	Hook	28	No	2				
LA	605	N	Rose Hills	3339	15.73	25.33	Diamond	20	No	1				X
LA	605	N	Peck	3340	16.78	27.02	Hook	13	No	1				
LA	605	N	Valley EB	4423	19.36	31.17	Loop	17	No	1				X
LA	605	N	Valley WB	4424	19.50	31.40	Hook	20	No	1				X
LA	605	N	Ramona	4434	21.23	34.18	Diamond	17	No	2		X		

METERED ON-RAMP OPERATIONAL INVENTORY

Co.	Rte	Dir	Location	E No.	PM	KP	Ramp Type	Ramp Storage	Platoon Metering	Total Lanes	HOV Location		"Meter on" Sign (Loc.)	
											Left	Right	Left	Right
LA	605	N	Lower Azusa	4427	22.37	36.02	Diamond	23	No	1				
LA	605	N	Arrow Hwy EB	4428	23.95	38.56	Loop	18	No	1			X	
LA	605	N	Arrow Hwy WB	4429	24.15	38.88	Hook	19	No	1			X	
LA	710	S	Cesar Chavez	3472	24.86	40.02	Hook	20	No	1				
LA	710	S	Third St	3473	24.54	39.51	Hook	30	No	1				
LA	710	S	Olympic Blvd	3474	23.47	37.79	Hook	20	No	1				
LA	710	S	Washington Blvd	3475	22.50	36.23	Loop	14	No	1			X	
LA	710	S	Atlantic SB	3476	21.88	35.23	Loop	20	No	1			X	
LA	710	S	Atlantic NB	3477	21.68	34.90	Hook	54	No	2				
LA	710	S	Florence WB	3478	19.59	31.54	Loop	25	No	2	X		X	
LA	710	S	Florence EB	3479	19.50	31.40	Hook	18	No	2		X		
LA	710	S	Firestone WB	3480	18.51	29.80	Loop	18	No	2	X		X	
LA	710	S	Firestone EB	3481	18.42	29.66	Hook	21	No	2		X	X	
LA	710	S	Imperial WB	3482	16.98	27.34	Loop	12	No	1				
LA	710	S	Imperial EB	3483	16.92	27.24	Hook	15	No	2	X		X	
LA	710	S	King	3458	15.90	25.60	Hook	12	No	2	X			X
LA	710	S	Rosecrans WB	3459	15.01	24.17	Loop	21	No	2	X		X	
LA	710	S	Rosecrans EB	3460	14.73	23.72	Hook	36	No	2	X		X	
LA	710	S	Alondra Blvd	3461	13.83	22.27	Hook	9	No	1			X	
LA	710	S	Artesia Bl	3089	12.80	20.61	Hook	15	No	1			X	
LA	710	S	Long Beach	3088	11.89	19.14	Hook	25	No	2	X		X	
LA	710	S	Del Amo WB	3084	10.95	17.63	Hook	24	No	2			X	
LA	710	N	Pacific PI	3031	9.72	15.65	Hook	12	No	1				
LA	710	N	Del Amo EB	3451	10.69	17.21	Hook	15	No	1			X	
LA	710	N	Del Amo WB	3452	11.00	17.71	Hook	24	No	1			X	
LA	710	N	Long Beach	3453	12.13	19.53	Hook	14	No	2	X			
LA	710	N	Atlantic	3454	13.29	21.40	Hook	30	No	1				
LA	710	N	Alondra Bl	3455	14.10	22.70	Hook	30	No	2		X	X	
LA	710	N	Rosecrans EB	3456	14.90	23.99	Loop	20	No	2		X	X	
LA	710	N	Rosecrans WB	3457	15.10	24.31	Hook	26	No	2	X		X	
LA	710	N	Imperial EB	3462	16.90	27.21	Loop	15	No	1				
LA	710	N	Imperial WB	3463	17.05	27.45	Hook	15	No	2	X		X	
LA	710	N	Firestone EB	3464	18.42	29.66	Loop	20	No	2	X		X	
LA	710	N	Firestone WB	3465	18.51	29.80	Hook	20	No	2	X		X	
LA	710	N	Florence EB	3466	19.50	31.40	Loop	20	No	2	X		X	
LA	710	N	Florence WB	3467	19.76	31.81	Hook	22	No	2	X		X	
LA	710	N	Olympic Blvd	3469	23.57	37.95	Hook	25	No	1				
LA	710	N	Third St	3470	24.44	39.35	Loop	20	No	1				

METERED CONNECTOR OPERATIONAL INVENTORY

Co.	Rte	Location	DIR	E No.	PM	KP	Ramp Storage (veh)	Platoon Metering (Yes/No)	Veh. / Green/ Lane	Total Lanes	Prepare to Stop Sign	Meter On Sign	Flashing Beacon	Metering Time Monday - Friday	
														AM Period	PM Period
LA	105	NB-405 to EB-105	E	5917	2.50	4.00	170	No	1	2	X	X	X		14:00 - 19:00
LA	105	SB-405 to EB-105	E	5916	2.82	4.51	346	Yes	2	2	X	X	X		14:00 - 19:00
LA	105	SB-110 to EB-105	E	5920	7.55	12.08	165	No	1	2	X	X	X		14:00 - 19:30
LA	105	NB-110 to EB-105	E	5911	7.56	12.10	100	No	1	2	X	X	X		14:00 - 19:30
LA	105	NB-710 to EB-105	E	5905	13.81	22.10	330	Yes	2	2	X	X	X		14:00 - 19:30
LA	105	SB-710 to EB-105	E	5906	13.94	22.30	430	No	1	2	X	X	X		14:00 - 19:30
LA	105	SB-110 to WB-105	W	5912	6.81	10.90	256	Yes	2	2	X	X	X	5:30 - 9:30	14:00 - 19:30
LA	105	NB-710 to WB-105	W	5903	13.01	20.82	364	No	1	2	X	X	X	5:30 - 9:30	14:00 - 19:00
LA	105	SB-710 to WB-105	W	5904	13.21	21.14	100	Yes	3	1	X	X	X	5:30 - 9:30	
LA	110	WB-105 to SB-110	S	5919	13.44	21.50	182	No	1	2	X	X	X		OFF
LA	110	EB-105 to SB-110	S	5913	13.45	21.52	74	Yes	2	1	X	X	X		OFF
LA	110	SB-5 TO SB-110	S	5900	25.41	40.66	250	No	1	2	X	X	X		OFF
LA	110	EB/WB-105 to NB-110	N	5914	14.50	23.20	275	Yes	2	3	X	X	X	6:00 - 10:00	14:00 - 18:00
LA	405	EB/WB-105 to SB-405	S	5918	22.30	35.68	464	Yes	3	2	X	X	X	6:30 - 9:00	14:00 - 19:30
LA	405	WB-105 to NB-405	N	5915	22.40	35.84	282	Yes	3	2	X	X	X	6:30 - 11:00	13:00 - 18:30
LA	605	EB-105 to SB-605	S	5909	7.20	11.52	372	Yes	3	2	X	X	X		14:00 - 19:00
LA	605	EB-105 to NB-605	N	5910	8.20	13.12	318	Yes	3	2	X	X	X	5:30 - 10:00	13:30 - 19:00
LA	710	EB/WB-105 to SB-710	S	5901	15.25	24.40	550	Yes	2	3	X	X	X	6:30 - 9:30	14:00 - 18:30
LA	710	EB/WB-105 to NB-710	N	5903	16.10	25.76	580	Yes	3	2	X	X	X	6:00 - 10:00	14:00 18:30

FUTURE ON-RAMP METERS

Proposed to be metered within the next 10 years				
County	Route	Direction	Location	Post Mile
LA	5	SB	Lake Hughes	59.700
LA	5	SB	Parker Rd.	58.830
LA	5	SB	Hasley Cyn.	56.47
LA	5	SB	Rye Cyn.	55.39
LA	5	SB	Rte. 126	55.3
LA	5	SB	Magic Mountain	53.41
LA	5	SB	Mc Bean Pkwy. EB	51.78
LA	5	SB	Mc Bean Pkwy. WB	51.42
LA	5	SB	Calgrove	48.88
LA	5	SB	Rte. 14	45.1
LA	5	SB	Roxford	42.48
LA	5	SB	San Fernando Mission WB	40.31
LA	5	SB	San Fernando Mission EB	40.05
LA	5	SB	Brand	39.91
LA	5	SB	Chatsworth	39.78
LA	5	SB	Paxton St.	39.14
LA	5	SB	Rte. 118	38.95
LA	5	NB	Paxton St.	39.31
LA	5	NB	WB Rte. 118	39.51
LA	5	NB	San Fernando Mission	40.44
LA	5	NB	Roxford	42.79
LA	5	NB	WB 210	44.333
LA	5	NB	Rte. 14	45.1
LA	5	NB	Calgrove	49.22
LA	5	NB	Lyons	50.43
LA	5	NB	Mc Bean Pkwy.	51.42
LA	5	NB	Magic Mountain	53.65
LA	5	NB	Rte. 126	55.531
LA	5	NB	Hasley Cyn.	56.75
LA	14	SB	Sand Cyn.	R33.397
LA	14	SB	Via Princess Way	R30.722
LA	14	SB	Sierra Hwy.	R30.643
LA	14	SB	Golden Valley	R29.542
LA	14	SB	Sierra Hwy./Placerita	R28.122
LA	14	SB	Placerita Cyn.	R27.876
LA	14	SB	San Fernando Rd.	R26.891
LA	14	NB	Sierra Hwy./Foothill	R25.095
LA	14	NB	San Fernando Rd.	R27.346
LA	14	NB	Placerita Cyn. EB	R28.056

FUTURE ON-RAMP METERS

Proposed to be metered within the next 10 years				
County	Route	Direction	Location	Post Mile
LA	14	NB	Placerita Cyn. WB	R28.274
LA	14	NB	Golden Valley	R29.978
LA	14	NB	Via Princess Way	R31.115
LA	14	NB	Sand Cyn.	R33.592
VEN	23	SB	New LA Ave.	11.211
VEN	23	SB	Tierra Rejada WB	10.355
VEN	23	SB	Tierra Rejada EB	9.924
VEN	23	SB	Olsen WB	8.212
VEN	23	SB	Sunset Hills WB	7.196
VEN	23	SB	Sunset Hills EB	7.005
VEN	23	SB	Los Arboles WB	6.058
VEN	23	SB	Los Arboles EB	5.871
VEN	23	SB	Janss WB	5.093
VEN	23	SB	Janss EB	4.891
VEN	23	SB	Olsen EB	1.903
VEN	23	NB	Hillcrest	3.926
VEN	23	NB	Janss EB	5.053
VEN	23	NB	Janss WB	5.254
VEN	23	NB	Los Arboles EB	6.020
VEN	23	NB	Los Arboles WB	6.219
VEN	23	NB	Sunset Hills EB	7.135
VEN	23	NB	Sunset Hills WB	7.368
VEN	23	NB	Olsen EB	7.903
VEN	23	NB	Olsen WB	8.303
VEN	23	NB	Tierra Rejada WB	10.121
VEN	23	NB	Tierra Rejada EB	10.160
LA	60	EB	SB Phillips Ranch Rd.	28.020
LA	60	WB	Garfield Ave.	5.360
LA	101	SB	Lindero Cyn. WB	37.575
LA	101	SB	Lindero Cyn. EB	37.347
LA	101	SB	Reyes Adobe	36.070
LA	101	SB	Kanan Rd.	34.910
LA	101	SB	Palo Comado Cyn.	33.764
LA	101	SB	Liberty Cyn.	32.552
LA	101	SB	Lost Hills Rd.	31.833
LA	101	SB	Los Virgenes WB	31.253
LA	101	SB	Los Virgenes EB	31.020
LA	101	NB	Los Virgenes	31.100
LA	101	NB	Lost Hills Rd.	32.072

FUTURE ON-RAMP METERS

Proposed to be metered within the next 10 years				
County	Route	Direction	Location	Post Mile
LA	101	NB	Liberty Cyn.	32.906
LA	101	NB	Palo Comado Cyn.	33.798
LA	101	NB	Kanan Rd.	35.2
LA	101	NB	Reyes Adobe	36.3
LA	101	NB	Lindero Cyn EB	37.495
LA	101	NB	Lindero Cyn WB	37.713
VEN	101	SB	Telephone Rd.	25.86
VEN	101	SB	Victoria	24.509
VEN	101	SB	Johnson Dr.	23.501
VEN	101	SB	Vineyard	22.031
VEN	101	SB	Vineyard	21.78
VEN	101	SB	Rose	20.972
VEN	101	SB	Rice	20.032
VEN	101	SB	Del Norte	19.024
VEN	101	SB	Central	17.59
VEN	101	SB	Los Posas EB	15.928
VEN	101	SB	Los Posas WB	15.797
VEN	101	SB	Carmen	14.663
VEN	101	SB	Fulton/Somis	13.913
VEN	101	SB	Dawson/Petit	13.555
VEN	101	SB	Pleasant Valley	12.31
VEN	101	SB	Pleasant Valley	12.25
VEN	101	SB	Camarillo Spring	10.9
VEN	101	SB	Wendy	7.7
VEN	101	SB	Borchard/R.Cornejo	6.89
VEN	101	SB	Ventu Pk EB	6.218
VEN	101	SB	Ventu Pk WB	6.064
VEN	101	SB	Lynn Rd. EB	5.006
VEN	101	SB	Lynn Rd. WB	4.839
VEN	101	SB	Moorpark	3.91
VEN	101	SB	Rancho Rd.	3.06
VEN	101	SB	Hampshire	1.493
VEN	101	SB	Westlake EB	0.632
VEN	101	SB	Westlake WB	0.458
VEN	101	NB	Westlake EB	0.68
VEN	101	NB	Westlake WB	0.786
VEN	101	NB	Hampshire	1.776
VEN	101	NB	Rancho	3.169
VEN	101	NB	Moorpark	4.28

FUTURE ON-RAMP METERS

Proposed to be metered within the next 10 years				
County	Route	Direction	Location	Post Mile
VEN	101	NB	Lynn Rd.	5.168
VEN	101	NB	Ventu Pk Rd. EB	6.186
VEN	101	NB	Ventu Pk Rd. WB	6.308
VEN	101	NB	Borchard	7.232
VEN	101	NB	Wendy	7.86
VEN	101	NB	Wendy	8.067
VEN	101	NB	Cammarillo Spring	10.806
VEN	101	NB	Pleasant Valley	12.275
VEN	101	NB	Pleasant Valley	12.396
VEN	101	NB	Flynn Rd.	13.226
VEN	101	NB	Dawson	13.689
VEN	101	NB	Carmen	14.871
VEN	101	NB	Las Posas	15.864
VEN	101	NB	Las Posas	15.987
VEN	101	NB	Central	17.897
VEN	101	NB	Del Norte	19.322
VEN	101	NB	Rice	20.047
VEN	101	NB	Rose	21.062
VEN	101	NB	Vineyard EB	21.966
VEN	101	NB	Vineyard WB	22.179
VEN	101	NB	Wagon Wheel	22.861
VEN	101	NB	Oxnard Blvd.	22.94
VEN	101	NB	Johnson Dr.	23.714
VEN	101	NB	Victoria Ave.	24.797
VEN	101	NB	Rte. 126	26.597
LA	110	SB	Torrance	7.784
LA	110	SB	Carson	6.865
LA	110	SB	223rd St	6.355
LA	110	SB	Sepulveda WB	5.493
LA	110	SB	Sepulveda EB	5.29
LA	110	SB	Pacific Coast Hwy	3.968
LA	118	WB	Glenoaks	13.174
LA	118	EB	Paxton	12.397
LA	170	NB	Vineland / WB Rte. 134	14.704
LA	170	NB	Tujunga / Riverside	15.032
LA	170	NB	Magnolia Blvd.	15.504
LA	170	NB	Burbank Blvd.	16.140
LA	170	NB	Oxnord St.	16.614
LA	170	NB	Victory Blvd. EB	17.191

FUTURE ON-RAMP METERS

Proposed to be metered within the next 10 years				
County	Route	Direction	Location	Post Mile
LA	170	NB	Victory Blvd. WB	17.418
LA	170	NB	Sherman Way EB	18.208
LA	170	NB	Sherman Way WB	18.413
LA	170	NB	Roscoe Blvd.	19.681
LA	210	EB	Yarnell	1.040
LA	210	EB	Roxford	2.140
LA	210	EB	Polk	3.440
LA	210	EB	Hubbard	4.280
LA	210	EB	Maclay	5.090
LA	210	EB	Paxton St.	6.250
LA	210	EB	Osborne	8.010
LA	210	EB	Wheatland	9.610
LA	210	EB	Sunland SB	11.060
LA	210	EB	Sunland NB	11.360
LA	210	EB	La Tuna Canyon	14.410
LA	210	EB	Lowell	15.890
LA	210	EB	Honolulu	15.890
LA	210	EB	Pennsylvania	17.000
LA	210	EB	La Crescenta	17.470
LA	210	EB	Ocean View	18.730
LA	210	EB	Angeles Crest SB	19.890
LA	210	EB	Angeles Crest NB	20.070
LA	210	EB	Foothill	21.010
LA	210	EB	Berkshire	21.650
LA	210	EB	San Dimas	R46.66
LA	210	WB	San Dimas	R46.31
LA	210	WB	Berkshire	21.410
LA	210	WB	Gould	20.420
LA	210	WB	Angeles Crest NB	19.870
LA	210	WB	Angeles Crest SB	19.680
LA	210	WB	Ocean View	17.950
LA	210	WB	Pennsylvania	16.620
LA	210	WB	Lowell	15.310
LA	210	WB	La Tuna Canyon NB	14.240
LA	210	WB	La Tuna Canyon SB	14.050
LA	210	WB	Sunland NB	11.160
LA	210	WB	Sunland SB	10.930
LA	210	WB	Wheatland	9.300
LA	210	WB	Osborne	7.730

FUTURE ON-RAMP METERS

Proposed to be metered within the next 10 years				
County	Route	Direction	Location	Post Mile
LA	210	WB	Paxton St.	5.920
LA	210	WB	Maclay	4.790
LA	210	WB	Hubbard	3.950
LA	210	WB	Polk	3.110
LA	210	WB	Roxford	1.760
LA	210	WB	Yarnell	0.870
LA	710	NB	EB PCH	6.83
LA	710	NB	WB PCH	7.01
LA	710	NB	EB Willow St.	7.81
LA	710	NB	WB Willow St.	8.06
LA	710	NB	Wardlow Rd.	9.16
LA	710	SB	EB PCH	6.803
LA	710	SB	WB PCH	6.801
LA	710	SB	EB Willow St.	7.73
LA	710	SB	WB Willow St.	7.96

NON METERED ON-RAMP

County	Route	Direction	Location	Post Mile
LA	2	EB	Glendale	14.350
LA	2	EB	Newell	15.270
LA	2	EB	Fletcher	15.720
LA	2	EB	San Fernando	16.100
LA	2	EB	Verdugo Rd.	16.860
LA	2	EB	York	17.580
LA	2	EB	Holly	19.160
LA	2	EB	Mountain	20.190
LA	5	SB	Gorman	85.820
LA	5	SB	Quail Lake	81.750
LA	5	SB	Smokey Bear	77.950
LA	5	SB	Vista Del Lago	74.450
LA	5	SB	Templin Hwy.	66.150
LA	5	SB	Olympic & Downey	14.160
LA	5	SB	Triggs	13.030
LA	5	NB	Rosecrans	3.749
LA	5	NB	Slauson & Telegraph	9.700
LA	5	NB	Garfield	10.720
LA	5	NB	Washington	11.540
LA	5	NB	Atlantic & Eastern	12.630
LA	5	NB	Atlantic & Telegraph	13.023
LA	5	NB	Ditman & Indiana	14.803
LA	5	NB	Calzona & Indiana	15.161
LA	5	NB	Fourth St.	17.710
LA	5	NB	State St.	18.410
LA	5	NB	Lake Hughes	59.700
LA	5	NB	Templin Hwy.	66.150
LA	5	NB	Vista Del Lago	74.450
LA	5	NB	Smokey Bear	77.950
LA	5	NB	Quail Lake	81.750
LA	5	NB	Gorman	85.820
LA	10	EB	State	18.808
LA	10	EB	Marengo/Soto	19.309
LA	10	EB	Eastern (to Rte. 710)	20.812
LA	10	EB	Eastern	21.064
LA	10	EB	Ramona (to S 710)	21.250
LA	10	WB	Campus	20.866
LA	10	WB	Herbert	20.056
LA	10	WB	Soto	18.988
LA	10	WB	State	18.420
LA	14	SB	Avenue A	R76.837

NON METERED ON-RAMP

County	Route	Direction	Location	Post Mile
LA	14	SB	Avenue D (138)	R73.840
LA	14	SB	Avenue F WB	R72.034
LA	14	SB	Avenue F EB	R71.850
LA	14	SB	Avenue G WB	R71.030
LA	14	SB	Avenue G EB	R70.848
LA	14	SB	Avenue H WB	R70.030
LA	14	SB	Avenue H EB	R69.848
LA	14	SB	Avenue I	R68.775
LA	14	SB	Avenue J-8	R67.514
LA	14	SB	Avenue K WB	R66.850
LA	14	SB	Avenue K EB	R66.658
LA	14	SB	Avenue L WB	R65.730
LA	14	SB	Avenue L EB	R65.554
LA	14	SB	Avenue M WB	R64.724
LA	14	SB	Avenue M EB	R64.540
LA	14	SB	Avenue N WB	R63.717
LA	14	SB	Avenue N EB	R63.506
LA	14	SB	Avenue P	R61.267
LA	14	SB	Avenue S	R58.085
LA	14	SB	Pearblossom Hwy.	R54.250
LA	14	SB	Soledad Cyn. Rd.	R51.476
LA	14	SB	Santiago Rd.	R50.617
LA	14	SB	Crown Valley Rd.	R48.465
LA	14	SB	Red Rover Mine Rd.	R46.543
LA	14	SB	Escondido Cyn.	R43.482
LA	14	SB	Agua Dulce Cyn.	R39.654
LA	14	SB	Shadow Pines (Soledad Cyn.)	R35.520
LA	14	NB	Shadow Pines (Soledad Cyn.)	R36.019
LA	14	NB	Agua Dulce Cyn.	R40.073
LA	14	NB	Escondido Cyn.	R43.037
LA	14	NB	Red Rover Mine Rd.	R47.131
LA	14	NB	Crown Valley Rd.	R48.808
LA	14	NB	Santiago Rd.	R50.938
LA	14	NB	Soledad Cyn Rd.	R52.524
LA	14	NB	Pearblossom Hwy.	R54.906
LA	14	NB	Avenue S	R58.400
LA	14	NB	Avenue N EB	R63.628
LA	14	NB	Avenue N WB	R63.810
LA	14	NB	Avenue M EB	R64.637
LA	14	NB	Avenue M WB	R64.834
LA	14	NB	Avenue L EB	R65.637

NON METERED ON-RAMP

County	Route	Direction	Location	Post Mile
LA	14	NB	Avenue L WB	R65.823
LA	14	NB	Avenue K EB	R66.660
LA	14	NB	Avenue K WB	R66.870
LA	14	NB	Avenue J	R68.141
LA	14	NB	Avenue I	R69.130
LA	14	NB	Avenue H EB	R69.952
LA	14	NB	Avenue H WB	R70.134
LA	14	NB	Avenue G EB	R70.953
LA	14	NB	Avenue G WB	R71.135
LA	14	NB	Avenue F EB	R71.956
LA	14	NB	Avenue F WB	R72.140
LA	14	NB	Avenue D EB	R73.956
LA	14	NB	Avenue D WB	R74.148
VEN	33	SB	Shell Rd.	2.712
VEN	33	SB	Stanley Ave.	1.566
VEN	33	NB	Main St.	0.398
VEN	33	NB	Stanley Ave.	1.720
VEN	33	NB	Shell Rd.	2.818
LA	60	EB	Markland	6.440
LA	60	WB	Seventh Ave.	14.120
LA	90	EB	Centinela	1.890
LA	90	WB	Centinela NB	1.770
LA	90	WB	Centinela SB	1.590
LA	101	SB	Rampart/Benton	3.248
LA	101	SB	Temple/110	1.326
LA	101	SB	Los Angeles	0.643
LA	101	SB	Commercial Way	0.607
LA	101	SB	Alameda/Comercial	0.606
LA	101	SB	Fourth St.	0.509
LA	101	SB	Vignes/Center	0.433
LA	101	NB	WB Los Angeles	0.131
LA	101	NB	Whittier/6th St.	0.258
LA	101	NB	Vignes/Center	0.456
LA	101	NB	Los Angeles/Alameda	0.910
LA	101	NB	First St.	1.016
LA	101	NB	Broadway	1.191
LA	101	NB	Grand Ave.	1.456
VEN	101	SB	Bates	43.421
VEN	101	SB	Seacliff / Rte. 1	39.044
VEN	101	SB	Solimar	32.592
VEN	101	SB	Rte. 33	30.548

NON METERED ON-RAMP

County	Route	Direction	Location	Post Mile
VEN	101	SB	Front / Chestnut	29.794
VEN	101	SB	Harbor / Seaward	28.643
VEN	101	SB	Seaward	28.322
VEN	101	NB	Main St.	26.925
VEN	101	NB	Seaward	28.604
VEN	101	NB	Oak/Californi	30.329
VEN	101	NB	Rte. 33	30.998
VEN	101	NB	Main St.	31.646
VEN	101	NB	Seadiff / Rte. 1	39.340
LA	105	EB	SB-Sepulveda	0.869
LA	105	EB	Hughes Way/Imperial	0.951
LA	105	WB	SB-Sepulveda	0.278
LA	110	SB	5th St.	22.844
LA	110	SB	Anaheim St.	3.108
LA	110	SB	C St. WB	2.809
LA	110	NB	11th St.	21.850
LA	110	NB	9th St.	22.394
LA	110	NB	8th St.	22.596
LA	110	NB	5th St.	22.973
LA	110	NB	Figueroa	24.057
LA	110	NB	Hill	24.563
VEN	126	EB	Victoria Ave. SB	1.436
VEN	126	EB	Victoria Ave. NB	1.522
VEN	126	EB	Kimball Rd.	2.911
VEN	126	EB	Wells / Rte 118	5.219
VEN	126	EB	Briggs Rd.	8.959
VEN	126	EB	Peck Rd. / Acacia	10.368
VEN	126	EB	Palm Ave.	11.482
VEN	126	EB	10 th. St. (Rte. 150)	12.140
VEN	126	WB	10 th. St. (Rte. 150)	11.954
VEN	126	WB	Palm Ave.	11.279
VEN	126	WB	Peck Rd. / Acacia	10.271
VEN	126	WB	Briggs Rd.	8.841
VEN	126	WB	Wells / Rte 118	4.798
VEN	126	WB	Kimball Rd.	2.607
VEN	126	WB	Victoria Ave.	1.241
LA	710	NB	Atlantic	22.150
LA	710	NB	Washington	22.560
LA	710	NB	Floral Dr.	25.340

ROUTE RESPONSIBILITIES

Afsaneh Razavi (Ramp Metering Branch Chief)

Phone (213) 897-0267

AREA ENGINEER: Wahib Jreij

Phone: (213) 897- 8483

Co/Rte	PM Limits	Limits	Assigned	Ph. Ext
LA-10	18.39/48.30	Route 101 to San Bernardino C.L.	Jreij / Demaplin	7-8483
LA-14	24.79/77.01	Route 5 to Kern County Line	Jreij	7-8483
LA-57	0.00/12.00	Orange County Line to Route 210	Jreij / Demaplin	7-8842
LA-60	0.00/30.50	East LA Inter. to San Bernardino C.L.	Jreij / Akramian	7-8483
LA-71	0.30/4.80	San Bernardino C.L. to Route 10	Jreij / Demaplin	7-8842

AREA ENGINEER: Iqbal Toorawa

Phone: (213) 897- 9133

Co/Rte	PM Limits	Limits	Assigned	Ph. Ext
LA-91	6.01/20.74	Vermont to Orange County Line	Toorawa	7-9133
LA-110	0.00/20.36	Route 47 to Rte 05	Toorawa	7-9133
LA-110	20.36/31.91	Route 05 to end of Freeway	Toorawa	7-9133
LA-110	Connector	(E/W)/B 105 to N/B 110	Benitez	7-1666
LA-110	Connector	E/B 105 to S/B 110	Benitez	7-1666
LA-110	Connector	W/B 105 to S/B 110	Benitez	7-1666
LA-110	Connector	S/B 5 to S/B 110	Toorawa	7-9133
LA-105	0.00/18.14	Airport (LAX) to Studebaker	Benitez	7-1666
LA-105	Connector	N/B 405 to E/B 105	Benitez	7-1666
LA-105	Connector	S/B 405 to E/B 105	Benitez	7-1666
LA-105	Connector	N/B 110 to E/B 105	Benitez	7-1666
LA-105	Connector	S/B 110 to W/B 105	Benitez	7-1666
LA-105	Connector	S/B 110 to E/B 105	Benitez	7-1666
LA-105	Connector	N/B 710 to W/B 105	Benitez	7-1666
LA-105	Connector	N/B 710 to E/B 105	Benitez	7-1666
LA-105	Connector	S/B 710 to E/B 105	Benitez	7-1666
LA-105	Connector	S/B 710 to W/B 105	Benitez	7-1666

AREA ENGINEER: Hanh Pham

Phone: (213) 897- 8772

Co/Rte	PM Limits	Limits	Assigned	Ph. Ext
LA-2	14.08/23.44	Glendale Blvd to Route 210	Pham / Demaplin	7-8842
LA-134	0.0/13.34	Route 170 to Route 210	Pham / Demaplin	7-8842
LA-210	0.00/52.00	Route 5 to San Bernardino C.L.	Pham / Demaplin	7-8772
LA-405	0.00/12.95	Orange County Line to Route 110	Atefyekta	7-9292
LA-405	12.95/21.44	Route 110 to Route 105	Torchin	7-6576
LA-405	Connector	E/W 105 to S/B 405	Benitez	7-1666

ROUTE RESPONSIBILITIES

Afsaneh Razavi (Ramp Metering Branch Chief)

Phone (213) 897-0267

AREA ENGINEER: Hamid Kalkatechi

Phone: (213) 897- 0294

Co/Rte	PM Limits	Limits	Assigned	Ph. Ext
LA-5	26.65/88.61	Rte 134 to Kern County Line	Kalkatechi	7-0294
Ven-33	0.00/5.66	Route 101 to Casitas Vista Road	Kalkatechi	7-0294
LA-101	11.60/38.19	Rte 101/134/170 Int. to Ventura C.L.	Kalkatechi / Atef.	7-0294
Ven-101	0.00/43.62	LA County Line to Santa Barbara C.L.	Kalkatechi	7-0294
Ven-126	0.00/13.24	Route 101 to LA County Line	Kalkatechi	7-0294
Ven-126	0.00/13.24	Route 101 to Hallock Drive	Kalkatechi	7-0294
LA-138	0.00/1.80	Route 5 to Gorman Post	Kalkatechi	7-0294
LA-170	14.57/20.55	Route 101 to Route 5	Kalkatechi	7-0294
LA-10	1.88/18.33	4th Street to East LA Interchange	Benitez	7-1666

AREA ENGINEER: Jack Kao

Phone: (213) 897- 9183

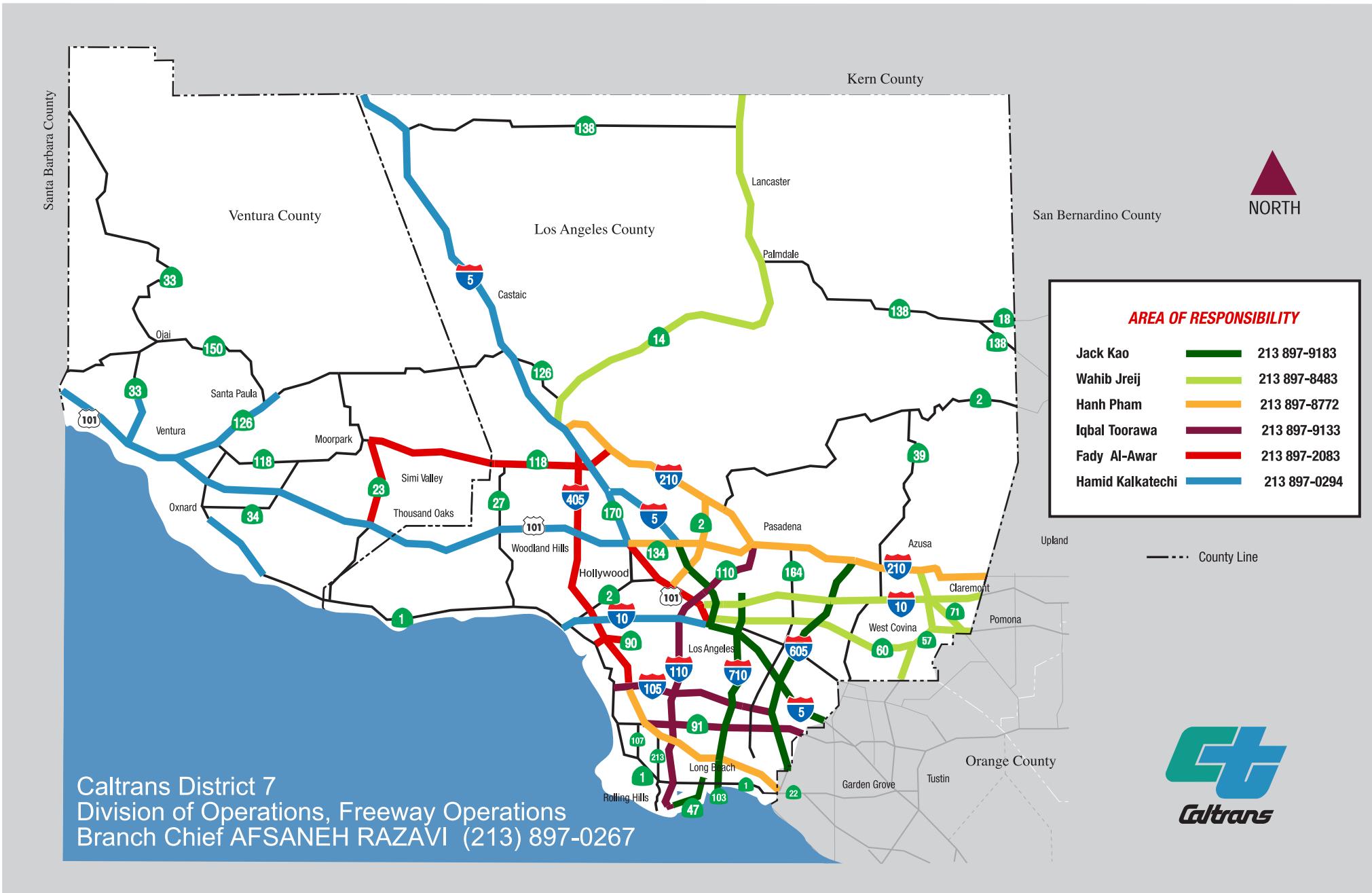
Co/Rte	PM Limits	Limits	Assigned	Ph. Ext
LA-5	0.00/26.65	Orange County Line to Rte 134	Kao / Nguyen	7-9183
LA-605	9.61/26.00	Route 05 to Route 210	Masatsugu	7-6372
LA-605	0.00/9.61	Orange County Line to Route 05	Nguyen	7-2074
LA-605	Connector	E/B 105 to N/B 605	Benitez	7-1666
LA-605	Connector	E/B 105 to S/B 605	Benitez	7-1666
LA-710	6.80/32.70	Route 1 to Route 210	Kao	7-9183
LA-710	Connector	E/W 105 to S/B 710	Benitez	7-1666
LA-710	Connector	E/W 105 to N/B 710	Benitez	7-1666

AREA ENGINEER: Fady Al-Awar

Phone: (213) 897- 2083

Co/Rte	PM Limits	Limits	Assigned	Ph. Ext
LA-101	0.18/11.60	Mission Rd to 101/134/170 Int.	Al-Awar	7-9292
LA-118	0.00/14.08	Ventura County Line to Route 210	Al-Awar	7-2083
Ven-118	18.20/32.60	Route 23 to LA County Line	Al-Awar	7-2083
Ven-23	3.20/11.60	Route 101 to Route 118	Al-Awar	7-2083
LA-405	48.64/39.40	Route 05 to Route 101	Al-Awar	7-2083
LA-405	39.40/21.44	Route 101 to Route 105	Torchin	7-6576
LA-405	Connector	W/B 105 to N/B 405	Benitez	7-1666
LA-90	0.92/3.28	Route 1 to Slauson	Torchin	7-6576

DISTRICT 7 RAMP METER AREA MAP



Attachment 2B

California Department of Transportation
DEPUTY DIRECTIVE

Number:

DD-35

Refer to
Director's Policy: 08-Freeway System Management

Effective Date: 1-3-95

Supersedes: P&P 91-01

Title: Ramp Metering

POLICY

Caltrans is committed to using ramp metering as an effective traffic management strategy to maintain an efficient freeway system and protect the investment made in constructing freeways to keeping them operating at or near capacity flow rates.

DEFINITION/BACKGROUND

Ramp metering is the common method of ramp entry control. It has been an effective tool in reducing congestion on California freeways since the late 1960's. Caltrans has installed over 1300 ramp meters throughout the state and proposes their installation on all urban freeway entrance ramps where metering will improve or maintain effective operations along freeway corridors.

RESPONSIBILITIES

The Traffic Operations Program Manager is responsible for the development, review and dissemination of policies, guidelines, and procedures for ramp metering (see Ramp Metering Policy Procedures).

The State and Local Project Development Program Manager is responsible for the development and review of geometric design standards for ramp metering and supports the inclusion of ramp metering in projects within freeway segments identified in the Ramp Meter Development Plan.

District Directors are responsible for developing local agency support for ramp metering; implementing ramp metering policies and procedures; and providing justification for deviation from established policy and procedures.

APPLICABILITY

Any employees involved with ramp metering activities.

ORIGINAL SIGNED BY

LEE F. DETER
Deputy Director
Maintenance and Operations

Attachment 3

RAMP METERING POLICY PROCEDURES

State of California
Business, Housing and Transportation Agency
Department of Transportation
Traffic Operations
August 1997

Attachment 4

RAMP METERING POLICY PROCEDURES

I. PURPOSE

The purpose of these procedures is to provide guidelines for implementing the Department's ramp metering policy (DD-35).

II. BACKGROUND

Metering has proven to be an effective traffic operations tool to maximize the efficiency of a corridor. The primary objective of metering is to reduce congestion and the overall travel time of the total traffic stream - on both freeway and surface streets. Ramp metering reduces congestion by:

- Maintaining more consistent freeway throughput.
- Utilizing the capacity of the freeway corridor more efficiently.
- Providing incentives for increased use of carpools, vanpools, and public transit by including preferential lanes, which offer timesavings to High Occupancy Vehicles (HOV) at ramp meters.

Secondary benefits include the reduction of congestion-related accidents and air pollution. Ramp meters operate most effectively when upstream mainline traffic is controlled. This control can be accomplished by installing additional ramp meters, metering freeway to freeway connectors or mainline control. These procedures focus on the implementation of ramp metering systems through a coordinated effort involving Caltrans planners, designers, operations personnel, local agency staff, the California Highway Patrol (CHP), and the public.

III. PROCEDURES

- A. It is the District's responsibility to maintain an acceptable level of service on the freeway system, to make the most effective use of each transportation corridor, and to protect the public's investment in the system.

Each District that currently operates, or expects to operate, ramp meters within the next ten years shall prepare a Ramp Meter Development Plan (RMDP) identifying the freeway segments, including freeway to freeway connectors, that are expected to be metered within this period. The RMDP should also identify freeway segments where upstream mainline control is necessary to maintain effective overall freeway operations. The RMDP shall be updated biennially and be included in local Congestion Management Plans.

- B. Projects, which propose the modification of an existing interchange or the construction of a new interchange within the freeway segments identified in the RMDP, regardless of funding source, should include provisions for ramp meters. This applies to all projects that have an approved Project Study Report dated July 1991 or later (the date of the original Policy and Procedure). These provisions, as defined in the Ramp Meter Design Guidelines, should include right of way, geometric to accommodate vehicle storage and HOV bypass lanes, ramp meter equipment, and CHP enforcement areas. Projects which propose additional capacity within freeway segments identified in the RMDP shall include provisions for ramp meters and shall implement the ramp meters at all entrance ramps within the project limits. In freeway segments identified in the RMDP where mainline control is necessary to maintain effective overall freeway operation, additional freeway capacity should not be constructed without an analysis of the operational impacts to downstream segments. Districts are responsible for performing appropriate environmental studies for ramp metering projects.
- C. The District will work in partnership with metropolitan planning organizations; regional transportation planning agencies, and congestion management agencies to program ramp metering projects and develop implementation plans. Coordination and consultation should be documented and concurrence may be obtained in any form the District considers appropriate.
- D. The Ramp Meter Design Guidelines prepared by the Division of Traffic Operations, in cooperation with the Division of State and Local Project Development, and the CHP shall be used when designing ramp metering facilities. This document is a compilation of design information and operational practices used statewide.
- E. HOV preferential lanes shall be considered wherever ramp meters are installed. The need for HOV bypass lanes should be included in the Project Study Report, Project Information Report, Project Report, and Environmental Document. If an HOV preferential lane is not included in a proposal to ramp meter, the reasons should be addressed in the appropriate document.

The District is responsible for consulting with the CHP on project features, which affect enforcement activities such as HOV lane violations, enforcement pads, etc. Coordination and consultation should be documented.

F. When selecting the appropriate metering method for the HOV preferential lane, the following criteria should be used:

Control: An analysis of HOV traffic volumes shall be made to determine the impact on mainline traffic flows. Where adverse impacts exist, consideration should include metering the HOV preferential lane and/or more restrictive metering of the SOV lane(s). Consideration should be given to metering the HOV preferential lane if platoons from local signalized intersections adversely affect the operation of the freeway. Storage capacity and effects to local arterials should also be addressed.

Merge Conditions: Prior to entering the freeway, all vehicles on the on-ramp should be provided with adequate space to safely merge with each other. The safest merge condition is when the speeds of the merging vehicles are identical. When the speed differentials between HOVs and SOVs are excessive, consideration should be given to metering the HOV lane. All ramps should be designed in accordance with the Ramp Meter Design Guidelines, which detail adequate merging distances.

Enforcement: The ability to safely enforce occupancy violations of HOV lanes is essential. The CHP should be consulted for their recommendation of enforcement operations at each HOV preferential lane location.

Corridor Operations: In corridors where ramp meters are already operational, the existing metering method may be used as criteria for additional installations in the same corridor. Should alternate metering methods be proposed along a corridor, local agencies should be consulted.

The criteria listed above can be applied to new and existing ramp meter installations. If it is being applied to an existing ramp meter, the following criteria should also be used:

Accident History: The accident history of the ramp needs to be investigated. If either the ramp or any portion of the freeway within 500 feet of the ramp gore has been flagged as a high accident concentration location (Table C), each accident report should be reviewed in detail to determine whether or not the HOV operation during the metered period was a contributing factor. If evidence suggests that it could have been a contributing factor to the accident, consideration should be given to metering the HOV preferential lane.

- G. Districts shall provide justification for deviation from the policy and these procedures and concurrence shall be obtained from the Headquarters Traffic Operations District Liaison. Deviations from design standards require the approval of the Project Development Coordinator in the Office of Project Planning and Design.
- H. The Division of Traffic Operations provides District personnel with technical assistance and support on the design and operation of ramp meter systems and assists in the preparation of the District's RMDP.

Attachment 4

CONTENTS OF EXCEPTION TO RAMP METERING POLICY FACT SHEET

PROJECT DESCRIPTION

Briefly describe the project. Note the type of project and/or major elements of work to be done.

RAMP METERING POLICY NON-COMPLIANCE FEATURES

Describe the proposed or existing ramp metering policy non-compliance feature(s). (Note: Deviations from advisory or mandatory design standards shall be addressed as required by the *Project Development Procedures Manual*, the *Highway Design Manual* and applicable District Directives.) Design exceptions to standards to be attached to Ramp Meter Policy Fact Sheet.

REASON FOR THE EXCEPTION

Be thorough but brief. Supportive factors may include right-of-way or space constraints, environmental concerns, inordinate costs, etc. Show an estimate of the added cost above the proposed project cost that would be required to conform to the ramp metering policy for which exception is being documented. The estimate does not have to be highly developed but must be realistic.

FUTURE CONSTRUCTION

Describe any planned future projects in the immediate vicinity of the requested ramp meter exception, but do not make any commitments (e.g., ramp metering as part of future projects) unless there is a certainty that they can be followed through.

PROPOSED EXCEPTION REVIEWS AND CONCURRENCE

Note reviews by HQ Traffic Operations, the District Liaison and District Office of Traffic Systems. Give dates of reviews and discuss any comments that were made and their disposition.

REMARKS

Note clarifying remarks. Discuss impacts on project delivery schedule and project costs, if any. Discuss impacts of ramp metering policy non-compliance features.

ATTACHMENTS

Provide a locations map and/or vicinity map for the project, indicating the location of the requested exception(s) to the ramp metering policy. Also provide cross-sections and/or special details as necessary to illustrate the policy non-compliance condition. Letters, resolutions, traffic studies, etc., which help to clarify the reasons for the exception request, may be attached.

SIGNATURE SHEET

The Fact Sheet signature page shall conform to the attached.

Attachment 4

Dist-Co-Rte-KP
Source Unit – EA
Project Cost

FACT SHEET

EXCEPTION TO
RAMP METERING POLICY

(Insert Registered C.E. Seal)

Prepared by:

(Name), Registered C.E.

Date

Telephone

Approval recommended by:

(Name), Project Manager

Date

Telephone

Concurrence by:

(Name), District Liaison
HQ Traffic Operations

Date

Telephone

Approved by:

(Name), District Division Chief,
Operations

Date

Attachment 4

State of California

Business, Housing and Transportation Agency

M e m o r a n d u m

To: DISTRICT DIVISION CHIEFS – Operations
DISTRICT DIVISION CHIEFS – Design
DISTRICT DIVISION CHIEFS – Planning

Date: July 31, 2000

File:

From: **DEPARTMENT OF TRANSPORTATION**
Traffic Operations
Mail Station 36

Subject: Ramp Metering Policy on High Occupancy Vehicle (HOV) Preferential Lanes

The purpose of this memorandum is to clarify and re-affirm the California Department of Transportation (Caltrans) policy on HOV preferential lanes at ramp meter locations. Caltrans is committed to its current policy: **An HOV preferential lane shall be provided at all ramp meter locations.**

The January 2000 edition of the Ramp Meter Design Manual now addresses the circumstances under which exceptions to this policy may be warranted. See 'Modifications to Existing HOV Preferential Lanes' located in Section 'I' of Chapter One:

- Underutilization of an existing lane plus the need for additional right-of-way for storage
- The availability of an alternate HOV entrance ramp within 2 Km
- The availability of a direct HOV access (drop) ramp

Exceptions shall be handled on a location-by-location basis. Conversions may require Federal Highway Administration actions or concurrence. The District Division Chief for Operations, in consultation with the Headquarters Traffic Operations Liaison, is responsible for approving and documenting decisions to remove HOV preferential lanes. These policies and exceptions also apply to new and reconstruction projects. Districts should refer to the "Exception to Ramp Metering Policy" located in the Appendix of the Ramp Meter Design Manual or contact your Headquarters Traffic Operations Liaison for assistance.

Original Signed By

KIM NYSTROM
Program Manager
Traffic Operations

cc: Mr. Robert Buckley
Program Manager
Design and Local Programs

Ms. Joan Sollenberger
Program Manager
Transportation Planning

Attachment 5

System Wide Adaptive Ramp Metering (SWARM)

System Wide Adaptive Ramp Metering, also known as SWARM, is a relatively new ramp meter operating system developed by National Engineering Technology (NET) Corporation. As the name indicates, it adapts the local traffic responsive concept to an entire freeway section or even multiple connecting freeways. However, this system can only be implemented from the traffic management Center through the use of the Advanced Transportation Management System (ATMS). Please note that Swarm is being tested by district 07 and has not yet been implemented on long term basis, similarly to traffic responsive metering.

Types of SWARM

There are three types of SWARM: SWARM 1 operates system wide to predict congestion, SWARM 2a and SWARM 2b operates locally and are based on headway and storage respectively.

- **SWARM 1**

SWARM 1 is system wide adaptive based on a freeway network divided into SWARM sections. Each section begins and ends at a mainline vehicle detection station (VDS) identified as a bottleneck. The SWARM 1 algorithm operates at bottleneck locations and controls the flow of all upstream ramp locations in this section.

Since density is directly related to congestion, it is monitored at each bottleneck location. The algorithm requires a nominal saturation density threshold value for each mainline VDS in the network.

The algorithm attempts to estimate the density n minutes (user settable) in the future. If the estimated density exceeds the bottleneck saturation density, then ramp meter rates will be computed in an attempt to head off the predicted onset of congestion.

Starting at the bottleneck and working upstream, the computer calculates new metering rates based on the required volume reductions. Actual metering rates are subject to maximum and minimum rates. Since reductions may be positive or negative, excess or surplus values are propagated upstream.

- **SWARM 2a**

SWARM 2a is local responsive based on headway (time between consecutive vehicles). It uses density function to compute local metering rates and attempts to maintain headway such that maximum flow can be obtained.

Attachment 6

- SWARM 2b

SWARM 2b is local responsive based on storage. It computes the number of vehicles stored between two VDS stations and compares it to a maximum storage value. Metering rates are computed to maintain level of service (LOS) D as long as possible.

Combinations of SWARM

SWARM can be implemented in 2 or 3 mode combinations; SWARM 1 and 2b, Swarm 1, 2b and 2a or any other combination. The most restrictive rate recommended by any of the Swarm modes will then be implemented.

Advantages of SWARM

- It maximizes traffic flow on the mainline.
- It is responsive to actual traffic conditions throughout the system.
- It is responsive to recurring and non-recurring congestion.

Disadvantages of SWARM

- Ramp control and traffic surveillance devices must be connected to a computerized communications center.
- Communication lines have to be maintained at all times in order for SWARM to operate properly.
- SWARM requires accurate data from mainline and on and off-ramp detectors in order to work effectively.
- It is more complicated than traffic responsive and fixed-time metering.

Attachment 6